The Magazine of the Registered Professional Engineer

American Engineer

MAY 1959

Starting Your Own Consulting Office

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Engineering Opportunities in the 50th State. Page 29.

• • •

Why Engineers Change Jobs in Industry. Page 33.

• • •

Plus These News Sections:

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Ethics
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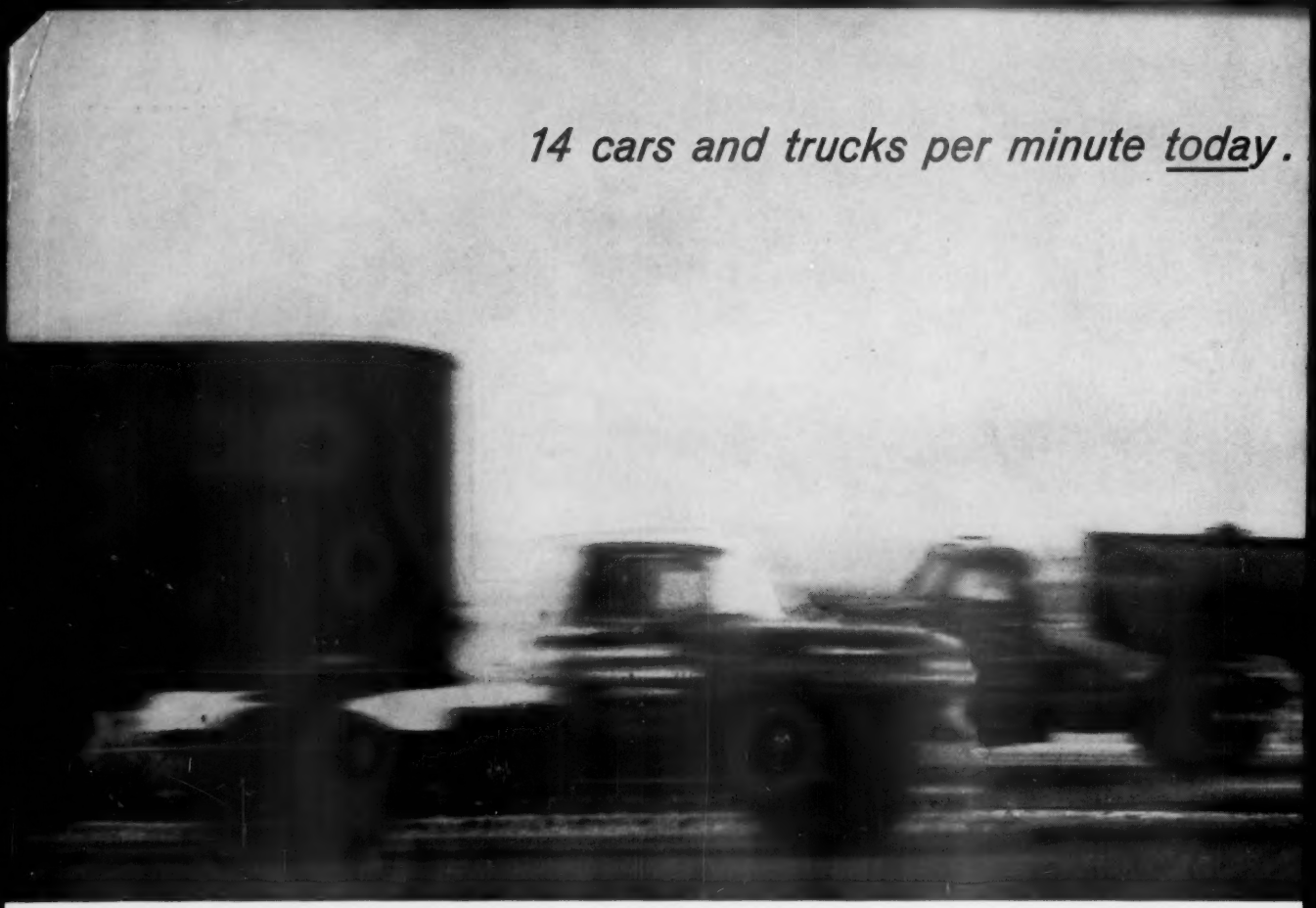

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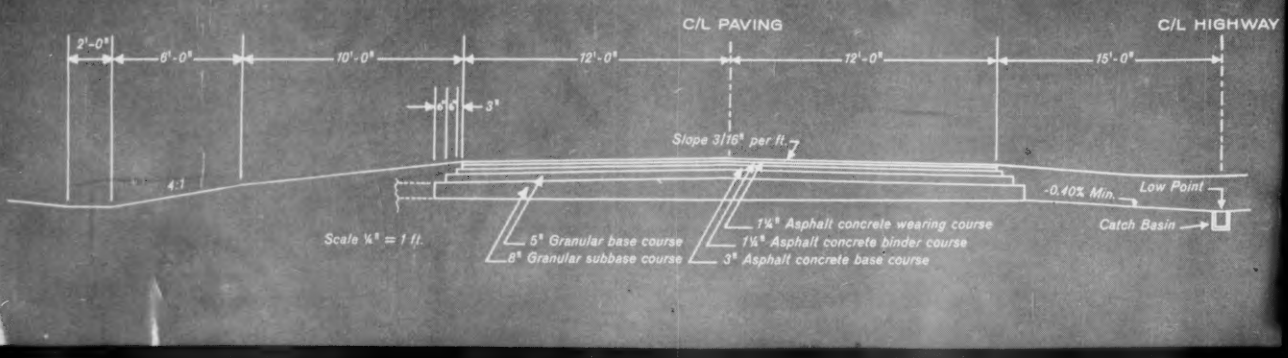

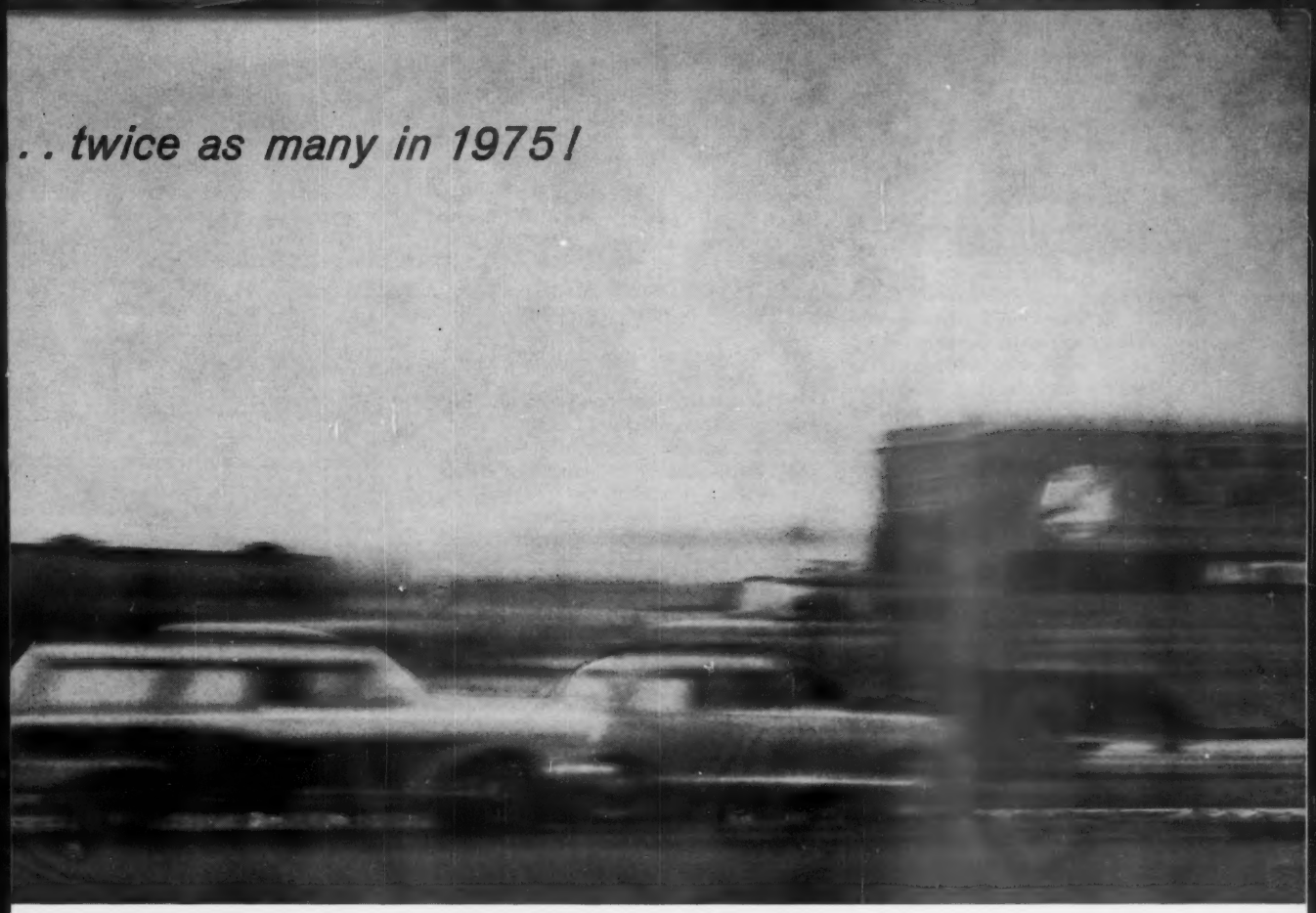

new Route 73 is Asphalt-paved

pavement structures are being built today to handle **any** desired loads with **any** desired built-in durability **. . . and these roads save money.** Cost less to build, less to maintain.

Your State can lay more road for the same money if you design for Asphalt concrete. More road means the traffic load on **all** pavements in your State can be kept at a maintenance-saving minimum.

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Letters to the Editor

Fluoridation Revisited . . .

Editor's Note: **In the March issue several letters were carried in response to a January article entitled, "The Engineer's Role in Fluoridation." It was felt at that time that no further correspondence would be printed but because of the continuing interest among AE readers, the following letters are presented. No more letters will be used, however, as it would appear that both sides have now received "equal time."**

Dear Editor:

I seriously question the propriety of publishing the article, "The Engineer's Role in Fluoridation" in the January, 1959, issue for the following reasons:

1. In my opinion it is entirely inappropriate for the AMERICAN ENGINEER to publish technical articles (these are properly the province of the Founder Society publications) unless such articles concern major scientific "break throughs" affecting all engineers. Examples: Atomic power, space travel, etc.

2. The article represents a virtual endorsement of fluoridation by the editor and by implication, the NSPE. Approximately 20 per cent of the magazine's material space, including the cover, is devoted to this subject. The Society, in my opinion, has no business nor right to endorse, either directly or by implication, any method or type of equipment used for any technical process.

The AMERICAN ENGINEER should, in my opinion, confine itself to articles on ethics, legislation, engineer - union problems, professional concepts, public services rendered by outstanding engineers, civic responsibilities of engineers, engineering training in school and industry, etc.

However, much more serious than the appropriateness of the subject matter, is the partisan slant given to the article which is inexcusable in a publication of the stature of the AMERICAN ENGINEER. Samples of partisan reporting:

1. The fluoridation headline on the front cover: "The Health of Millions at Stake." Certainly this is an exaggeration. There are many more serious diseases than tooth decay.

2. Whereas you have listed outstanding proponents of fluoridation, nowhere in the article do you identify the organizations who are opposed to fluoridation nor their reasons therefor.

3. The constitutional issue of the violation of individual right involved in mass medication is entirely omitted.

It seems to me that all sides of the issue should be presented if the engineers are to reach logical conclusions.

On the credit side, I wish to compliment (the staff) on the new cover arrangement and the artistic use of color and photographs throughout the magazine.

I. RUSSELL BERKNESS, P.E.
Richmond, Va.

Dear Editor:

I agree with H. A. Pace in the March issue that "The Engineer's Role in Fluoridation" in the January issue, is "excellent."

I am surprised that men such as Reuter and Brosene (AE, March, Letters to the Editor), who have apparently qualified for the title P.E., should believe that the benefits of fluoridation, which have been extensively proven, as the article states, are "propaganda" or subject to "freedom of choice."

I feel that the findings of physicians and dentists in their fields, accepted by their official bodies, are a matter of fact and not of opinion.

Possibly the objectors want a vote of the people and "freedom of choice" in the acceptance of a chlorinated water supply, proper disposal of sewage, pasterurized milk, vaccination of school children, and high standards of sanitation which have given America unprecedented records of good health and longevity. They might even wish to repeal the law of gravity.

LEROY F. CHRISTMAN, P.E.
Reading, Pa.

Dear Editor:

Engineers Reuter and Brosene, in their letters to the editor (March, 1959) appear to object to inclusion of discussion of controversial subjects in AE.

I live in an area where a substantial number of fellow citizens believe in a flat earth. In spite of the controversial nature of this subject, I feel no qualms whatever when I specify the mass of a client's piston gage weight to develop a given force at a distant point on the earth's surface, even though to do so must presuppose a far different figure of the earth.

To me, only trouble and isolation result from the avoidance of controversy or from failure to understand the cause of controversy.

PAUL G. EXLINE, P.E.
Tulsa, Okla.

Dear Editor:

A few letters to the editor (AE, March, 1959) take exception to the presentation of Romer and Martin's article on fluoridation, because in the minds of some people the desirability of fluoridation is still regarded as a controversial question.

In answer, may I suggest that the only way controversial problems get solved and controversial procedures find their proper sphere for application is by discussion of the pros and cons.

It would be a reasonable assumption that the editor and the authors would have no objection to other engineers presenting technical evidence against fluoridation if such is available. Not being a sanitary engineer, but an engineer who tries to keep up with the progress of engineering in general, I cannot settle the question; but I have a very strong impression that fluoridation is helpful in many localities, and that most objections to it are based on popular prejudices, and on the suspicion of new things that is frequently stirred up by those running for political office.

Anyone wishing to find evidence on fluoridation tests may look through the civil engineering and sanitary engineering journals, and he will find plenty of evidence that will justify

(Continued on page 6)

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MAY 1959
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FOUNDED 1934

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LETTERS

(Continued from page 4)

fluoridation as advocated by Romer and Martin. The opponents of fluoridation seldom present technical data—they frequently raise political, social, and legal objections. Any advocacy that such matters should be determined by popular vote seems to be contrary to the principles of good government. We elect representatives in whom we have confidence to appoint (or select by civil service) technical experts and to judge the merits of technical recommendations. *Nothing could be more foolish and wasteful than to have the public vote on highly technical questions.*

Furthermore, as an intelligent group of citizens we engineers have a duty to keep informed as well as we can on technical problems of public interest, because we are frequently asked by our neighbors for our opinions on all engineering matters, even if far removed from our particular specialty.

Still more disturbing to me is the attitude of a few engineers that the AMERICAN ENGINEER should keep away from controversial subjects. There may be some argument as to whether strictly technical questions should be discussed in the AMERICAN ENGINEER, but controversial problems requiring engineering facts and engineering judgment for their solution certainly come within the field of this publication....

We expect leadership and statesmanship in an editor. It is his duty to discuss and argue whenever leadership seems to be called for. Following popular opinion is for politicians. Discussing only known facts and uncontested recommendations is for those nonprofessionals who worship what Kipling called "the god of things as they are."

It would seem that a true professional attitude demands that engineers study problems that are new and unsolved, rather than carry on in a routine way the present state of engineering knowledge. There is no possible way of divorcing engineering and economics, or of separating technical engineering problems from social and political problems. We cannot set up sound civic policies without the help of engineers and editors who are not afraid of something new or controversial.

E. E. GEORGE, P.E.
Little Rock, Ark.

Dear Editor:

Mr. Brosene's stand on "The Engineer's Role in Fluoridation" is dinosaurian. He feels that editorializing on the merits of fluoridation has no place in our professional publication and that it is his duty to champion the public's right to freedom of choice. I feel it my duty to point out to Mr. Brosene the right of freedom of expression and that as professional engineers we should take a stand on fluoridation; a stand in favor of fluoridation if we are to satisfy that part of our creed where we dedicate our professional knowledge "to the advancement and betterment of human welfare."

I wonder if Mr. Brosene feels the same towards chlorination—if he would leave the decision to chlorinate Cincinnati's water to public vote? And who is to say that fluoridation is not equally as important to the "advancement and betterment of human welfare" as is chlorination? I suggest that Mr. Brosene drive out to the Robert A. Taft Sanitary Engineering Center on Columbia Parkway and find out.

VERN W. TENNEY, P.E.
San Mateo, Calif.

Dear Editor:

H. H. Reuter criticizes a particular passage on page 21 of the fluoridation article in the January AE as a mixture of technical detail and propaganda without supporting evidence. This passage constitutes a summary of statements on page 20 with a reference given in a footnote.

W. G. Brosene then discusses nonengineering topics in the AE, the freedom of choice, the use of the vote of the public to decide on fluoridation, and trusting the good judgment of the people. Have not the people exercised their freedom of choice, their vote and perhaps even good judgment in the election of their government officials who generally have the responsibility of employing competent and responsible engineers and public health officials? Also, when has there ceased to be any common ground of responsibility between the professional engineer and the public health physician when both are concerned with treatment of a public water supply? I submit that the *competent* professional engineer in the water supply field must be able to evaluate public health data as to adequacy of controls in experiments, validity of comparisons and logical derivation of conclusions—based upon a sound *general* grasp of the health and other scientific principles involved—in order to intelligently perform the engineering tasks necessary. Concluding this rebuttal, I ask where is the evidence conclusively

(Continued on page 44)

"This Month"

With sincere apologies to Sir Walter Scott, let us open "This Month" by saying, "Breathes there a man with soul so dead, who never to himself has said, 'I'd like my own consulting office'?" Few, indeed, we avow. So, it is for this great majority that this May issue leads off with the article "Starting Your Own Consulting Office," by a man who did it. Page 23.

It's not all pineapples and dancing girls in Hawaii, the latest member of the union. Turn to page 29 and find out how this romantic land is moving into an era of true technological achievement.

Engineers in industry change jobs more often than they should and the result is wasted effort and money for all concerned. Why is this so? Many of the questions are answered in "Why Engineers Change Jobs in Industry," page 32. The piece is based on an extensive study of the problem and is in itself a blueprint for action.

Attention consulting and construction engineers: Many professional engineering societies have published schedules of fees for consulting engineers, and manuals of practice, but it is only now that a report has been prepared which summarizes these various publications. The article beginning on page 35 reviews this report and tells how copies of it can be easily obtained.

Hopscotching the profession for headlines, pages 8-20:

General news stories: Labor legislation on Capitol Hill poses a threat to the separate election rights of professionals in the construction industry . . . Salaries of electronics engineers reviewed . . . 1959 "Who's Who in Engineering" now off the presses.

Consulting: Maximum $100 per diem rate is recommended to Congress and, in another story, an Illinois court's decision on a consulting engineer's claim to recover fees due.

Ethics: The Iowa Engineering Society has been active in many areas in the field of ethics during the past year and here is a comprehensive review of what has been accomplished.

In Government the lead story registers protest of the appointment of a physician to replace an engineer as director of the Office of Saline Water, U. S. Department of the Interior. In other news: The Civil Service Commission has announced success in recruiting 200 young engineers.

Industry: The Western Electric case goes before the NLRB . . . A new report "Unorganized Engineers' and Scientists' Opinions of Collective Bargaining for Professionals Like Themselves," will be released in June by the University of Michigan . . . And, the NLRB has turned down a request by the union, Engineers and Architects Association, for a new election at the California plant of the Standard Steel Corporation.

Registration: The big news here is from Mississippi where the registration board has ruled on a significant title case.

Kenneth E. Trombley

Editor

Labor Legislation Poses Threat to Professionals

Pending labor legislation amendments pose a serious threat to the separate election rights of professional employees in the construction industry, the National Society has stated in testimony before the House Subcommittee on Labor-Management Reform Legislation.

Executive Director Paul H. Robbins testified that under the so-called Kennedy-Ervin type bill "professional employees could, and undeniably would, be forced to be represented by and join a heterogeneous labor organization contrary to their wishes and contrary to the existing language of the Taft-Hartley Act."

Mr. Robbins told the House group that the Society favored language in the law which would assure professional employees in the construction industry of the continuation of their right to determine their own fate in labor-management relations. He said that the Senate Committee's bill did not contain the desired safeguard-language, but the Senate Committee report did state that the construction industry amendment:

> ". . . in no way modifies other provisions of the statute with respect to special types of employees such as professional employees. Thus, it is neither the intention nor effect of the bill to affect the status which professional engineers now enjoy under the statute."

The intent expressed in the Senate Committee report should be carried into legislative language in amendments to the law, Mr. Robbins said, to avoid possible misunderstanding or doubt on the point.

The National Society testimony emphasized that its objections were based on the fact that the Kennedy-Ervin type bill "would sanction employer-union collective bargaining agreements in the construction industry where the majority status of the union has not been established under the Taft-Hartley Act prior to the agreement." Mr. Robbins testified that although assurances have been received from both Senator Kennedy and the Department of Labor that the pending legislation is not intended to affect the present self-determination rights of professional employee, NSPE believes such assurances are rendered meaningless without a provision for an NLRB certification.

"Without the protection of a Board certification," he said, "professional employees are completely at the mercy of employer-union agreements, and we can see only too plainly a situation in which professional employees may become the pawns in the chess game of collective bargaining."

Scientific Publications Supported by NSF

Support of scientific publications and information services by the National Science Foundation as part of a stepped-up program under its office of Science Information Service totaled more than half a million dollars in twelve grants during the first quarter of 1959, it has been announced.

The intensified program is designed to assist scientific publications faced with difficult problems in making available to the scientific community mounting quantities of newly produced research results.

Support of this type by the Foundation during calendar year 1958 totaled $1,032,994 in fifty-one grants. Compared with the 1959 first quarter figure of $527,803, eight grants totaling $109,300 were made during the same quarter of 1958.

National Science Foundation grants assist publications during critical periods, encourage testing of experimental methods of speed-

Salary Growth Expected

An extensive survey of "Today's Electronic Engineer," conducted by *Electronic Industries*, covering approximately 1,900 electronic engineers, indicates considerable optimism about their future. As shown by the following table, there is a general expectation of substantial salary growth in the next five years (medians):

Other aspects of the survey cover personal information and opinions of the group, ranging from marital status to church attendance, and data on job satisfaction, reasons for job changes, etc.

Table Shows Five-Year Predictions

Age Group	Five Years Ago	Today (Dec. 1958)	Five Years From Now
Under 25	$	$ 6,750	$10,760
25-29	5,000	7,675	11,652
30-34	5,792	7,700	13,762
35-39	7,226	11,250	14,770
40-44	6,312	11,030	14,582
45-49	7,512	10,983	14,782
50-54	8,704	12,235	15,790
55 and Over	10,500	13,927	17,220

ing valuable laboratory results into print, and develop new ways of helping scientists find what they need. Support also extends to strengthening data compilation centers, studies of existing bodies of knowledge to guide researchers, and other projects to enable scientists to use existing but unanalyzed data.

Alger and Beckwith to Receive Lamme Medal

For the first time since it was established in 1928, the American Institute of Electrical Engineer's Lamme Gold Medal has been awarded jointly to two engineers, Philip L. Alger, of Schenectady, and Sterling Beckwith, of Lake Forest, Ill., it has been announced by N. S. Hibshman, executive secretary of AIEE. The Medal will be presented at the summer general meeting of the Institute at Seattle, Wash., Monday, June 22.

Mr. Alger, who recently retired from General Electric Company, and Mr. Beckwith, who is a consulting engineer, were awarded the Medal "In recognition of their contributions to the arts and science of design and application of rotating electric machines."

Their selection for the honor, was made by the AIEE Lamme Medal Committee, of which Dean W. J. Seeley, of Duke University, Durham, N.C., is chairman. The Medal is financed by a bequest of the late Benjamin G. Lamme, chief engineer for Westinghouse Electric and Manufacturing Co. (now Westinghouse Electric Corp.) to honor a member of AIEE "who has shown meritorious achievement in the development of electrical apparatus or machinery."

New 1959 "Who's Who in Engineering" Released

The 1959 edition of *Who's Who in Engineering*, a comprehensive biographical volume of the nation's outstanding engineers, which also includes a directory of engineering and engineering-connected groups, has just been published.

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"Outstanding Public Service Award"

Charles E. Zimmerman, right, president of Consultants and Designers, Inc., engineering services organization with headquarters in New York, receives Army's "Outstanding Public Service Award" from Secretary of the Army Wilber M. Brucker for his company's contributions toward the successful launching of America's first satellite, Explorer I.

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publication, produced under standards of qualification established by the Advisory Committee of Engineers Joint Council. Approximately 18,000 engineers are included in this volume.

In addition to alphabetical indexing, the new volume contains convenient geographical-divided index as well as the directory of engineering groups on both state and national levels.

Telemetering Conference Scheduled for May 25-27

"Investigation of Space," is the theme of the 1959 National Telemetering Conference planned for May 25-27 at the Brown Palace and Cosmopolitan Hotel, Denver, Colo. The conference is sponsored by the American Institute of Electrical Engineers, the American Rocket Society, the Institute of Aeronautical Sciences and the Instrument Society of America.

EJC Announces 1959 Societies Directory

EJC has announced the publication of the 1959 Engineering Societies Directory. This is the first revision of this publication since June, 1956.

The Directory provides basic information concerning international, national, regional, state and local engineering groups; and includes address, membership, secretary and organizational publications.

It is divided into six major sections: International Organizations; Joint Bodies in the United States; National Engineering Societies; State, Regional, Local Bodies; Registration Boards, and Canadian Engineering Societies.

Design Engineering Show Features Huge Exhibit

A huge $10,000,000 exhibit of some 12,000 products to help research and development executives and engineers plan the products of the 1960's will be unveiled in Philadelphia May 25 when the Design Engineering Show—sponsored by ASME—opens for a brief, four-day run at Convention Hall.

Maximum $100 Per Diem Rate Recommended To Congress

A maximum per diem rate of $100 for temporary consultants engaged by the Federal Government has been urged by NSPE in recommendations made to Congressional Appropriations Committee chairmen.

The National Society points out that consulting engineers have stated that current maximum per diem rates of $50 or even $75, allowed by several Federal agencies, are insufficient for the economically feasible performance of consulting engineering services due to existing high overhead expenses.

The Society recommendations call attention to the fact that "the net result of a Federal limitation less than $100 per day could very well be that the most qualified engineering firms would refrain from undertaking engineering projects for the Government, leaving the Government's choice to less qualified consultants, although the Federal Government deserves and is entitled to the very best engineering talent available."

NSPE cited recent statutes creating the National Aeronautics and Space Administration and the Federal Aviation Agency as recognizing the need for adequate per diem compensation in that they contain provisions for permitting a maximum per diem allowance of $100.

The Congressional appropriations chairmen were informed that the Society "heartily endorses the principle of utilization of engineering consultants by the Federal Government on a per diem basis, or such other basis as may be mutually agreed upon. Legislation establishing maximum per diem fees should reflect an allowable per diem rate of at least $100."

Many state societies of professional engineers have established recommended fee schedules, each of which calls for at least a $100 per diem rate, NSPE pointed out.

Illinois Court Denies Engineer's Claim

A consulting engineer's claim to recover fees due on account of services rendered in the design of a city water works system was denied by an Illinois appellate court on the ground that the contract entered into between the engineer and the city was null and void. The basis for the court's decision was a state statute which declared that unless a prior appropriation had been made to cover the expenses incident to any contract entered into by municipal authorities, such contract shall be null and void as to the municipality, "and no money belonging thereto shall be paid on account thereof * * *."

Facts brought out in the case showed that the city had adopted an ordinance providing for water work improvements, the entire cost of which, including the engineering expense, was to be paid out of funds derived from the sale of revenue bonds, the bonds to be a lien against water revenues only and not a general obligation of the city. Subsequently, a contract was signed providing for the rendition of engineering services by the plaintiff, and pursuant to the contract, some work was actually performed. Later, however, the city abandoned the project, repealed the ordinance and no revenue bonds were issued. The plaintiff engineer contended that inasmuch as the contract provided for the payment of his fee from the special fund to be raised by the sale of revenue bonds and not from the city's general funds, the state statute requiring prior appropriations did not apply. The city, on the other hand, claimed that the statute did apply and that the contract therefore was null and void.

After analyzing in detail the terms of the engineer's contract with the city, the court ruled that "the contract on its face discloses that the engineer was to be paid out of a special fund created by the sale of bonds, if such bonds were sold, but the contract further provides that in case bonds were not sold, the plaintiff was to be paid a part of his fee out of the general fund." Accordingly, the court concluded, "we are of the opinion that the contract by its terms obligated the defendant [city] to pay certain engineering fees out of the general fund, in the event that a special fund was not available."

Since the contract obligated the city to pay for engineering services under certain contingencies out of the general fund, and since no prior appropriation had been made to cover this payment as required by statute, "the contract was void at the time of its execution because such contract is expressly prohibited, and a contract expressly prohibited by a valid statute cannot be enforced." (*Beling v. City of East Moline*, 144 N.E. 2d 865).

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Iowa Ethics Committee Works Toward Raising Standards

Setting its sights on three major areas—publicity, complaints, and interpretation of the Code of Ethics—a committee within the Iowa Engineering Society did considerable work last year toward raising the professional engineering standards in their state.

The Professional Ethics Committee established these goals at the outset of 1958:

- Awakening an interest on the part of professional engineers and the public in the legal and ethical mores under which the profession of engineering should be practiced in Iowa.
- Creating and putting to the test an aggressive, workable procedure for processing and handling complaints concerning the illegal or unethical practice of professional engineering in Iowa.
- Clarifying, on the basis of case experience, the "intent" of the Code of Iowa and the Code of Ethics to serve as a guide for further revision of the codes.

E. R. Baumann served as chairman of the Committee, while Sherman A. Smith was vice chairman.

First, in the matter of publicity, the Committee mailed letters to firms carried in engineer listings in the "Yellow Pages" of Iowa telephone directories to make certain that only properly registered engineers were listed. At this writing, forty-three replies revealed: four firms are cancelling their listing since they are not engaged in the practice of engineering and/or were not registered; two firms indicated they were not registered, but were not engaged in the practice of engineering• and would *not* remove their listing, and thirty-seven firms provided the detailed list of their registered engineers and areas of practice.

Work is being done to prevent the listing of firms not represented by registered engineers.

As evidence of the success of this portion of their objectives, the Committee has reported that nine requests for Iowa Engineering Society membership applications have been received from professional engineers whose interest was stimulated by the work of the Committee. Also, as a result of publicity given to its efforts, the Committee received thirty formal and seventeen informal complaints involving the alleged illegal or unethical practice of professional engineering.

In the complaint department, the main offenders were persons falsely using a designation implying that they were registered engineers. Fifteen such cases were reported. Warning letters were sent to most of these individuals, while others were referred to the Board of Engineering Examiners and the NSPE Ethics Committee.

Other complaint cases were handled which involved a company incorporating to provide engineering services when no member of the firm was a registered engineer; persons allegedly practicing engineering *without* a license; practicing with *improper* license, and practicing in violation of the Code of Ethics.

On the basis of the cases studied, interpretation of the Iowa Code by the attorney general through the Board of Engineering Examiners, and Committee interpretation, the Committee has stated that:

1. A city engineer must be a registered professional engineer.

2. A consultant who performs the duties of city engineer for a municipality under a contract which could be interpreted to make him "an officer of the municipality" must limit his other contracts with the municipality to avoid violating the "conflict of interests" portions of the Iowa Code.

3. A registered professional engineer *must adhere* strictly to the ethics of the engineering profession and confine his practice to the branches or speciality *in which he was examined and granted his certificate.*

4. The Committee considers it to be unethical for an engineer who is not registered or for any firm which does not employ a registered professional engineer to request listing in the "Yellow Pages" of a telephone directory under an engineering classification.

The Committee reported that two sections of the Code of Ethics have created a conflict of opinion —Section A-3-c says "He (an engineer) shall assume his share of gratuitous public work and shall offer his services when his particular knowledge and ability are of benefit," while Section C-2-d says "He (an engineer) is entitled to compensation for professional advice. He shall not offer advice free."

These sections are still under study by the Committee.

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Appointment of Physician to Replace Engineer Protested

- Miller Becomes Saline Water Director
- NSPE Protests in Letter to Secy. Seaton

The appointment by the Secretary of the Interior of a medical doctor to replace an engineer as director of the Office of Saline Water has been protested by NSPE.

The protest was made on the basis of Secretary of the Interior Fred A. Seaton's appointment of Dr. A. L. Miller, a physician and former member of Congress from Nebraska who was defeated in the 1958 elections, to replace David S. Jenkins, a graduate civil engineer, as head of the Office of Saline Water. Mr. Jenkins was appointed assistant director of the Office.

Executive Director Paul H. Robbins termed the Office of Saline Water as "clearly an engineering program." In a letter to Secretary Seaton, he cited the legislative authority for the program which calls for "careful engineering studies," and the engaging of engineers and engineering firms to perform the necessary scientific research.

"We can think of few, if any, Federal programs," Mr. Robbins stated in his letter, "which are so clearly engineering projects under any reasonable interpretation of Congressional intent and actual operation."

Mr. Robbins also cited a 1958 amendment to the law concerning the Office of Saline Water which refers to the engineering aspects of the program in the definition of demonstration plants for sea or brackish water conversion processes.

"Our sole interest in this connection," he stated, "is to call attention to the principle that Federal positions of high responsibility which are primarily of an engineering nature should be filled by qualified professional engineers."

Macy New Commissioner Of Public Buildings

A prominent Connecticut consulting engineer, Ralph G. Macy, has been named commissioner of public buildings with headquarters in Washington, D.C., it has been announced by the General Services Administration.

He succeeds F. Moran McConihe, who recently resigned.

Prior to his appointment, Mr. Macy was a consulting engineer and director of the Norwalk Powdered Metals Company.

"Maybe we could change the plans and run the highway through Smith's field—he raises chickens!"

Prominent Leaders to Lecture at Seminar

More than twenty-five prominent scientific and professional leaders in Government, education, and industry will lecture or participate in panel discussions at the Civil Service Commission's 8-day Scientific and Professional Management Institute to be held May 25-June 3 at Stone House, National Institutes of Health, Bethesda, Md.

The interagency training program is open to employees in grades GS-13 and 14 who are in supervisory positions in basic or applied research or in professional services in the physical or life sciences, including unit and section chiefs, laboratory project leaders, project engineers, group leaders, and program directors.

The special seminar is designed to improve effectiveness of employees in their present jobs and to aid in the development of their future capabilities by study of important concepts and current issues relating to the organization and administration of scientific and professional activities in Government.

CSC Nears Recruiting Goal of 200 Engineers

The Civil Service Commission says its recently announced goal of recruiting 200 of the nation's most promising young engineers and scientists for outstanding careers in research appears to be near attainment. More than a thousand young engineers responded to the announcement last December of a new research scientists examination designed to attract the most inquisitive and promising seniors and recent graduates. Of 372 who took the first written test, 105 attained passing grades. The second written test is expected to produce an equal or larger number. The starting pay for the special jobs is set at $5,430 a year, as compared with normal starting pay of $4,490 for beginning engineering and scientific jobs.

Professionalism Case Goes Before NLRB

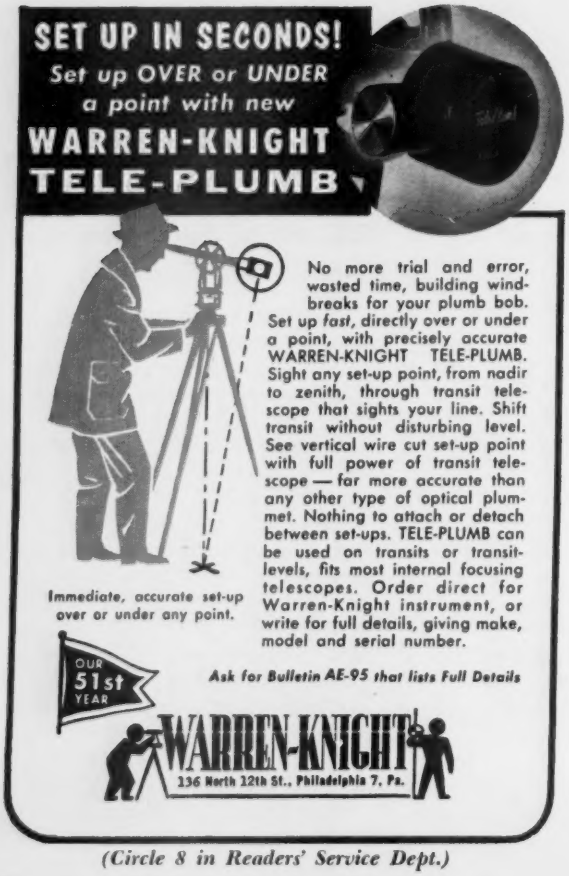
- Western Electric, Union Differ
- NSPE Files as 'Friend of Court'

After more than a year of hearings, and a record of 3,993 pages, the NLRB has for decision the petition of the Council of Western Electric Professional Employees-National, ESA, for a new election among engineers of the Western Electric Company throughout the nation. The original 1952 certification, which the union abandoned by its new petition, covered a mixed professional and technical unit. The union says it is now seeking an all-professional unit, and the parties agree on the division of more than 7,000 employees as between professional and nonprofessional classification under the Taft-Hartley definition, with the exception of less than 500 employees whose status is in dispute.

Because the case involves basic differences of opinion on the correct interpretation of the professional definition, and because the parties are urging the Board to adopt certain criteria or standards in applying the definition, several outside organizations have filed "friend of the court" briefs with the Board. It is understood that the Auto Workers, and American Federation of Technical Engineers, both AFL-CIO, have filed briefs. NSPE, at the request of both parties, and as one of the original sponsors of the professional provisions in the law, has filed a brief with the Board, setting forth principles which it believes should be followed in applying the professional definition. The NSPE brief does not support either party on the particular case in dispute, but, rather, indicates basic principles and elements which the Board should consider in applying the professional definition to any case. In summary, the NSPE brief proposes the following points:

- The work performed is controlling, and the four subdivisions of the definition refer to a description of the kind and type of work.
- Determination of professional status must be by appropriate work groupings, as distinguished from individual determination, which could lead to industrial chaos in employment patterns and would be inconsistent with the Congressional desire to promote harmony and stability in employment relations.
- Advanced knowlelge under Subsection (iv) of the definition is a collateral factor to evaluate in determining whether the work being performed is professional.
- Consideration should be given to a general principle that the appropriate work group must be essentially or substantially composed of individuals with the formal advanced knowledge evidenced by a college-level degree or, in the case of engineers, registration under a state registration law, to sustain a finding that the work is professional.
- Private criteria of the parties based on experience alone, where the work being performed does not meet the criteria of the four subdivisions, should be rejected.

In view of the extensive record and briefs, a Board decision and subsequent election is not expected before the end of the year. The company and the union are expected to engage in an "all-out" campaign before the vote is taken.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Collective Bargaining Report To Be Released

A report titled, "Unorganized Engineers' and Scientists' Opinions of Collective Bargaining for Professionals Like Themselves," will be released in June by the Bureau of Industrial Relations, University of Michigan. The report is based on an analysis of interviews with more than 250 engineers and scientists in ten companies—chemical, automotive, electronics and pub-

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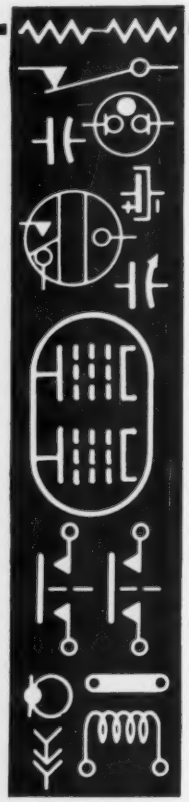

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lic utilities. The sponsors are conducting a seminar on the study, May 14-15, on the campus. Those interested in attending the seminar should write John W. Riegel, director, Bureau of Industrial Relations, University of Michigan, Ann Arbor, Mich. A registration fee of $50 covers room and meals.

Preliminary findings released by Professor Riegel indicate that about twenty per cent of the group interviewed think favorably of some form of collective action, but only half of this group think in terms of collective bargaining along union lines. The remainder think their professional societies could do more on salary information distribution to members and management. Of the majority group, fifty per cent were strongly opposed to any form of collective bargaining and twenty-nine per cent were milder in their opposition to the union approach.

Other preliminary findings indicate no significant relationship between ratings of an individual's performance and his attitude toward collective bargaining, but a high relationship between how an individual feels about his salary and how he views collective bargaining. There is a wide difference in attitude as between employees of the various companies, based largely on satisfaction with salary and treatment by management.

Labor Board Rejects Union Request for New Election

An effort by an engineering and technician union to set aside an election it lost, 14 to 7, has been turned down by the NLRB. The union, Engineers and Architects Association, protested the pre-election statements of officials of the Standard Steel Corporation, Vernon, Calif. Prior to the vote among engineers and draftsmen last December, the company officials were alleged to say that if the vote was for the union, it would take a long time to elect officers and committeemen, and that the negotiations would take a long time, but if the vote was against the union, raises would be forthcoming immediately. Also, the union charged the company officials with saying that if the engineers and draftsmen voted for the union a strike would probably result and the company could bring in other employees to do the work.

In rejecting the union's request for a new election, the Board said there was no evidence to support the contention that the first statement was made, and that the material published by the company did not contain any unlawful or coercive language. The Board held that the remarks about the possibility of a strike, even if true, was a permissible campaign statement which the employees could evaluate for themselves. (21-RC-5502, March 15, 1959)

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Mississippi Registration Board Rules on Title Case

In an action brought by the State Board of Registration for Professional Engineers, a Mississippi court ruled recently that an unlicensed individual who held himself out as a "Mechanical Designer" could perform work described as mechanical engineering for registered architects and engineers so long as he continued to perform such work under their supervision and control, and so long as the architects or engineers assume responsibility for it and have the work turned out under their own title block, name and seal. The defendant was, however, permanently enjoined from calling himself a "Mechanical Designer" and from representing himself or implying in any way that he was a professional engineer.

This matter was brought to the Board's attention through a resolution adopted by a joint interprofessional relations committee of the Mississippi Chapter of the American Institute of Architects and the Mississippi Society of Professional Engineers to the effect that the joint committee considered the defendant to be practicing and to be offering to practice engineering in violation of the State statute.

The defendant maintained an office, employing three persons, and used the title "Mechanical Designer" on his letterhead, in the city telephone directory and on his office door. He prepared drawings and specifications for heating, air-conditioning and plumbing systems, but never did any of this work for private individuals or clients. He worked exclusively for and under the supervision and control of licensed engineers and architects, and all of the plans or specifications prepared by the defendant were submitted to clients under the title block of the engineering or architectural firm. Engineering practitioners and engineering educational authorities introduced as witnesses at the trial characterized and classified the work of the defendant as constituting mechanical engineering.

In its complaint the Mississippi Board sought to enjoin the defendant from practicing engineering without a license, and from in any way implying or representing himself to be a professional engineer. The Board contended that while an unlicensed individual could engage in engineering work under the supervision and control of licensed engineers or architects in the status of an employee, he could not perform the same work as a separate firm or business. Such a business, the Board maintained, constituted the practice of professional engineering without a license in violation of the Mississippi Act.

In the course of its decision, the court discussed rather extensively the inter-relationship of the architects' and engineers' registration statutes, noting that "an architect can do any and all professional services with reference to the planning, designing and constructing of a building including 'the equipment or utilities thereof, or the accessories thereto.'" The court also stated that "the Legislature apparently felt that under the broad definition of an architect and the work that he may perform, even engineering work may be performed by him."

As for the character of the work performed by an architect, the court noted that "it is left up to his conscience, good judgment and discretion as to whether he does the work personally, has the work done in his own office, has it done outside his own office, or whether he hires a registered professional engineer to do any part of the work. As long as the architect takes the responsibility of turning out the work under his name and under his title block, it makes no difference under the statute where the work is performed."

In conclusion, the court held that the defendant should be enjoined from doing mechanical design work or mechanical engineering for private individuals or members of the public, but disagreeing with the Board, stated that he should not be enjoined from performing mechanical engineering for architects or registered professional engineers under their supervision and control, where such architects or engineers take the responsibility for his work and turn it out under their title block, name and seal.

The court did, however, restrain the defendant from using the term "Mechanical Designer" on his office door, stationery or telephone listing, "or by verbal claim, sign, advertisement, letterhead, card, or in any other way represent himself to be a professional engineer, or through the use of some other title, imply that he is a professional engineer."

According to latest reports, the Mississippi Board of Registration for Professional Engineers has voted to appeal this decision to the State Supreme Court. (*State Board* v. *Rogers,* No. 53,975 Chancery Court, First Judicial District of Hinds County, Mississippi.)

AE Meetings of Note

American Institute of Industrial Engineers — Annual National Conference and Convention, May 14-16, Biltmore Hotel, Atlanta, Georgia.

American Ceramic Society — Annual Meeting, May 17-21, Palmer House, Chicago, Illinois.

Society of American Military Engineers—National Convention, May 18-19, Mayflower Hotel, Washington, D.C.

Canadian Council of Professional Engineers — Annual Meeting, May 20-22, Fort Garry Hotel, Winnipeg, Manitoba.

National Telemetering Conference —Sponsored by AIEE, American Rocket Society, Institute of Aeronautical Sciences, and Instrument Society of America, May 25-27, Cosmopolitan Hotel, Denver, Colorado.

Design Engineer Show — Sponsored by American Society of Mechanical Engineers, May 25-28, Convention Hall, Philadelphia, Pennsylvania.

Now Available . . .

Standard Contract Forms Covering Engineer-Architect and Architect-Engineer Agreements

Standard Forms of Agreement are now available after many years of effort by NSPE's Interprofessional Relations Committee to develop suitable contract documents for use when both architects and engineers are working jointly on a project. Six Forms have been prepared, three where the engineer is principal and three where the architect is principal. The documents are primarily guides and need not be used exactly as prepared.

A complete kit with the set of six Forms plus explanatory material is available for $1. Additional copies of the individual Forms are available at the following rates: 1-25 copies, 20c each; 26-100 copies, 15c each, and over 100 copies, 10c each.

Agreement between Engineer and Architect on Percentage Basis . . . Form No. 2

Agreement between Engineer and Architect on Basis of a Multiple of Direct Personnel Expense . . . . . Form No. 3

Agreement between Engineer and Architect on Basis of a Professional Fee Plus Reimbursement of Expenses . . . . . Form No. 4

Agreement between Architect and Engineer on Percentage Basis . . . Form No. 5

Agreement between Architect and Engineer on Basis of a Multiple of Direct Personnel Expense . . . . . Form No. 6

Agreement between Architect and Engineer on Basis of a Professional Fee Plus Reimbursement of Expenses . . . . . Form No. 7

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Canadian Firm Fined For False Advertising

A Montreal, Canada, general contracting corporation was recently found guilty and fined for illegally using the title "Engineer" in the firm's advertising. The Superior Court judgment declared that the firm's advertisements—"Engineers-Contractors"—could lead to the belief that the defendant company was a member of the Corporation of Professional Engineers of Quebec, and that the firm had the right to practice or exercise the profession of civil engineering.

The action was brought by the Corporation of Professional Engineers of Quebec, the 8,000 member licensing body of the engineering profession in Quebec, and was the first of its kind against a limited company (corporation). The controversy was viewed by the profession as a test-case affecting limited companies using the title of engineer in the Province.

The Professional Engineers' Act of Quebec declares, in part, that no person may use the title "Engineer" or advertise himself as such unless he is a member of the Corporation of Professional Engineers of Quebec. Limited companies cannot be members of the professional society and consequently, such limited companies cannot use the term "Engineer" in their advertising. The prohibition goes beyond the use of the word "Engineer" or "Engineering" in the name of the firm, and extends as well if the words are used either before or after the firm name to describe the activities of the company. Such description becomes part of the firm's title, and is prohibited by the Act.

Counsel for the firm maintained that it had not used the title "Professional Engineer" or "Civil Engineer" which appear in other sections of the Quebec Act. The Court, however, considered this line of argument nonpersuasive, and ruled that the Act was sufficiently clear and prohibited the use of even an abbreviation of the title of "Engineer."

Strictly Business

Personalities . . . The appointment of **Thomas E. Long** as Eastern regional manager of the **Portland Cement Association** has been announced . . . **Mine Safety Appliances Company,** Pittsburgh, Pa., has announced the appointment of **John P. Lytle** as manager of engineering, Safety Products Division . . . **Gordon E. McCallum** has been named as head of the newly-formed Division of Water Pollution Control in the **Public Health Service,** Washington, D.C. . . . **Wallace J. Beckman** and **Edward T. Davel** have been promoted to the rank of associate in the firm of **Consoer, Townsend and Associates,** Chicago, Ill. . . . **International Resistance Company,** Philadelphia, Pa., has announced the appointment of **Larry McFarren** to chief engineer of its Burlington, Iowa, plant . . . The appointment of **H. Corbyn Rooks** to vice president-engineering at **The Trane Company,** La Crosse, Wisc., has been announced by **D. C. Minard,** president of the firm . . . **Paul R. Gravenstreeter** has been named district engineer for the Detroit, Mich., district office of the **Clark Controller Company . . . Charles D. Preusch** has been appointed materials and process engineer by the **Crucible Steel Company of America,** Pittsburgh, Pa.

Mr. Long

Harold F. Schulte has been appointed chief engineer of **Wheelabrator Corporation,** Mishawaka, Ind. . . . **Cornell Janeway** has been named vice president in charge of operations for **Janeway Engineering Company,** Detroit, Mich. . . . The appointment of **Alfred Doig, Jr.,** to the post of chief engineer of **The National Cash Register Company's** Electronics Division, Hawthorne, Calif., has been announced . . . **E. I. Bricker** has been appointed division engineer of **Lockheed-Georgia's** Engineering Research Laboratories, **Lloyd E. Frisbee,** chief development engineer, has announced . . . **Robert J. Prochaska** has been appointed advance development specialist in **General Electric Company's** Chemical Materials Department polycarbonate engineering section at Pittsfield, Mass., according to an announcement by **Leroy S. Moody,** engineering manager . . . **Robert G. Engman** has joined **Leach Corporation,** Compton, Calif., as a senior magnetics engineer . . . The appointment of **William P. Novack** as supervisor of manufacturing engineering and **Carlyle Moore** as manager of technical reproductions has been announced by the Technical Products Division, **Packard Bell Electronics Corporation,** Los Angeles, Calif.

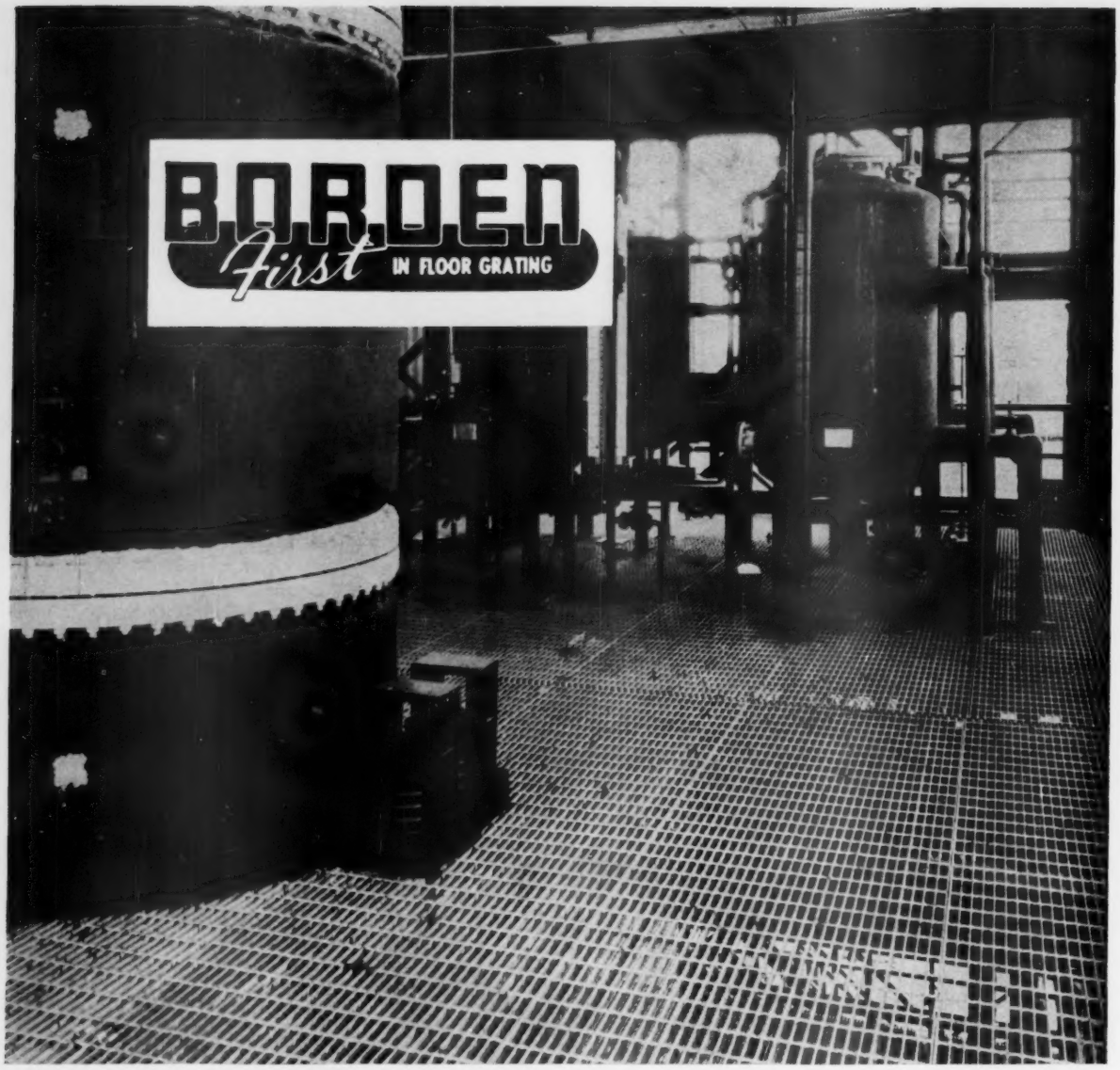
Mr. Doig

Richard H. Starrett has been named chief production engineer at **The Pfaudler Company,** Rochester, N. Y. . . . **David L. Matthews** has been appointed manager of manufacturing of **Goodrich-Gulf Chemicals, Inc.,** Cleveland, Ohio, it has been announced by **P. W. Cornell,** vice president . . . **Granville M. Read,** chief engineer of the **Du Pont Company** for the past thirteen years, has retired after a 43-year career. He has been succeeded at the Wilmington, Del., company by **Melvin F. Wood. Charles E. Daniels** has been named assistant chief engineer . . . **Henry M. Taylor** has been appointed manager of military marketing for the Electronics Division of **Stromberg-Carlson** with headquarters in Rochester, N. Y. . . . **George J. Thormeyer** has joined **Photronix, Inc.,** Columbus, Ohio, as executive vice president, and also will be assistant chief engineer of its associated consulting firm, **Barrett Associated Engineers . . . Henry M. Chance II,** president of **United Engineers & Constructors, Inc.,** to the board of directors of **Pennsalt Chemicals Corporation,** Philadelphia, Pa. . . . **Dale Pennington** and **Carl B. Salan** have been appointed field engineers for **Endevco Corporation,** Pasadena, Calif.

Mr. Read

Four well-known businessmen were recently added to the board of directors of the **Union Asbestos and Rubber Company,** Chicago, Ill. Those elected were **James W. Alsdorf,** president, **Cory Corporation; Patrick H. Hoy,** president, **Hotel Sherman, Inc.,** and **Ambassador East, Inc.;** Attorney **William J. Friedman,** and **Edward E. Voynow,** president, **Edward E. Petry & Company . . . Reichold Chemicals, Inc.,** White Plains, N. Y., has announced the appointment of **Herbert E. Miegel** to the newly-created post of vice president-engineering . . . **John T. Lurcott** has been named product engineer in the product engineering and development department of **The Carpenter Steel Company's** Alloy Tube Division, Union, N. Y. . . . The appointment of **Russell G. Heyl, Jr.,** as chief engineer-research and development for the **American Metal Products Company,** Detroit, Mich., has been announced . . . **T. C. Warner** has been promoted to chief development engineer, Electro-Mechanical Section of **MB Manufacturing Company's** Vibration Equipment Division, New Haven, Conn. . . . **Ian Williamson** has joined **Ling Electronics, Inc.,** Culver City, Calif., as manager of field service engineering.

Mr. Miegel



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Gentlemen:
Please send me NEW 1959 BORDEN Catalog.

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16-page catalog showing all basic types of grating; more than 30 dimensional drawings of subtypes; eight safe load tables for steel and aluminum grating.

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Plants at: Union, N. J.; Leeds, Ala.; Conroe, Tex.; Beeton, Ont.

(Circle 10 in Readers' Service Dept.)

Can you use the instruments of the profession? Here is an engineer from the author's Panama office using the audigage to determine the thickness of steel plate.

You've Got to Have Heart . . . Lots of it!

Starting Your Own Consulting Office

By

ROBERT H. EMERICK, P. E.

Consulting Engineer

SHOULD YOU? Everybody's not suited to the consulting life, (including one's family), and dissatisfaction can develop despite a successful start.

For example, after more than two years of practicing, one consultant came home at week's end and told his wife:

"Dear, you can't buy that new hat this week. Collections haven't been coming in."

"For you," she commented, "they never come in. Either you get a regular job and bring in money twice a month, or I'm going to Reno."

He didn't let her go to Reno, because, in fact, he was getting very tired of slow collections himself.

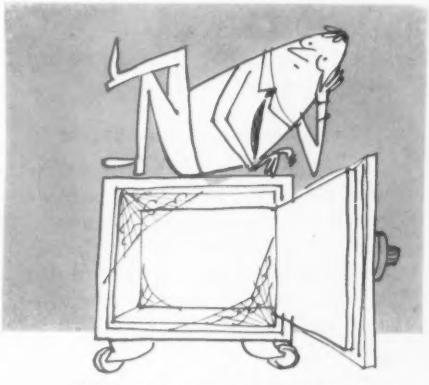
Collection problems, like taxes, are always present, and we can't make them go away by closing our eyes and wishing. This means that the new consultant should have enough money on hand to feed his family and buy his wife new hats, for at least a year. Many engineers have made it on a six months' supply, but this writer finished up his own first year three thousand in the red.

The Clients Don't Walk In

They don't even phone. This means that the new consultant must be ready and willing to execute the hat trick. The hat trick consists of putting on your hat, and overcoat, too, if it's winter, and going out to visit every potential client in your town.

Although the expressed purpose of these visits is to announce the opening of the new office and to indicate your readiness to serve, they are fundamentally sales calls. If the host across the desk likes your looks and the way you talk, and particularly if you know somebody he knows, the seed may sprout. He might even sponsor you in one helpful way or another. For example, he might invite you to speak on your specialty before the Rotary Club, or the Kiwanis, or some other organization of which he is a member.

Speeches are better than news-



Collections are sometimes slow . . .

Off to a great start but for how long? . . .

papers ads, because they provide you with a captive audience, and what you say is reported in the papers anyway. This is first class publicity.

Moral: If you are no good at public speaking, the sooner you learn how to do it well, the better.

While speech-making is accompanied usually by a free meal, there are other banquets and meetings which the aspiring consultant should attend for promotional reasons, despite the dent the ticket may make in his slim finances. This is what is known in international relations as "showing the flag." In other words, your presence is public evidence that you are a consultant in being, and are to be reckoned with the next time a job comes up.

This all boils down to what we are tempted to call an axiom of the business: Jobs come in because people who have them to assign, *know you,* either *directly* or by *hearsay.*

The Twenty-One Gun Salute

We know of a new consultant who set up his office in a suite of rooms that cost him $600 a month. He laid wall-to-wall carpeting, hung oil paintings on the walls, and peopled the place by a draftsman and a secretary in addition to himself. To be sure that everybody in town knew he was in business, he gave himself a housewarming with all the architects, contractors, and other possible clients invited.

As one of the guests remarked, with a goblet of champagne in one hand and a thirty-five cent cigar (provided by the consultant) in the other:

"This guy's certainly launching himself with a twenty-one gun salute."

Unfortunately, he lasted only three months. He spent all his money on the salute to himself.

The fact is, a consultant's worth is not established by the noise he makes. Perhaps more engineers start with their first offices in their homes, than elsewhere.

This is a very good way of starting, if the house allows space for a desk, a drawing board and a file cabinet. Office rent is avoided, your wife can answer the telephone and write your letters, and some of the house costs are chargeable to business, which helps on the annual income tax.

This arrangement, of course, is merely temporary for a business that really gets going. Incoming work soon brings with it the need for more space, a draftsman or two, a conference area for discussions with clients and your own people. The point is, a home start avoids committing a sizable amount of money before you earn it.

Don't Scorn A Tale of Woe

Every town has a variety of engineering problems that the big, solidly established consultants can't afford to handle. For example, smoke from somebody's stack is getting into somebody's stew, or water won't drain from a ditch, or the contractor who installed it can't make his elaborate all-year air conditioning system work as it should, and so on.

And what every town needs, whether it has one or not, is a registered engineer who, like the family doctor, can hear these tales of woe and with one visit and the wisdom of knowledge, set the situation right. The fee is small, from $50 to $100, but for the new consultant each of these troubles can be a job, and it's surprising how many hats or pork chops these small fees can buy. Even more important, is the satisfaction and bolstered confidence that accrues from a problem solved.

GOING back to my personal experience, in my second year of practice the city in which I lived opened an abandoned military base as an industrial park. The development board persuaded a large number of small industries to set up operations in the new park, and I was busy a substantial part of the year in designing new boiler plants, heating and air conditioning installations and revamping old equipment for new operating conditions. The charge to each was nominal, but at the end of the year, the total enabled me to break even, despite some bad accounts elsewhere.

As Woolworth discovered, and proved, it's not the individual profit that has significance, but the total.

Your Formula For Ulcers

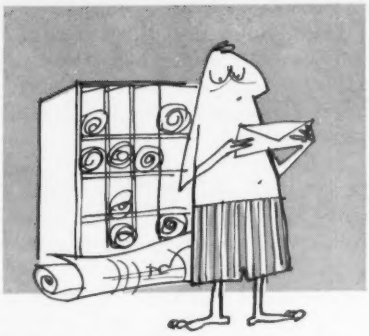
A consulting acquaintance told me:

"I'm working sixteen hours a day trying to keep up with the changes on a couple of jobs, and I've got two draftsmen out with the 'flu,' and my secretary has gone home to have a baby, and I've a bank loan coming due without the money to meet it, and one of my clients who owes me a lot of money has gone into bankruptcy, and last week I had a hemorrhage from a duodenal ulcer, and the doctor told me I've got to quit work for a couple of weeks and I can't. What *can* I do?"

I told him:

"You can do what I did. Go to

Needed: A new philosophy and quick . . .



Call the Bunko Squad. Sadder but wiser . . .

the hospital and spend three weeks on your back and let the ulcer stop bleeding. And while you're lying there you can remodel your philosophy of practice. No more sixteen hour days, no more worry about the bank loan—they'd rather trust you than a dead man. And if you can't get the work out when they want it, due to no fault of yours, let 'em wait. It's always the fellow who thinks he can do everything who gets ulcers."

So the prospective consultant should ask himself, "Am I of the temperament that gets ulcers? Will I become nervous and upset from overwork and repeated frustrations?"

If the answer is in the affirmative as it usually is with people subject to inner drives, a sane pre-practice philosophy should be established before the regular paycheck is given up. For all these troubles are sure to be yours as the years come and go, and unless safeguards are prepared ahead of time, they can get you down, even down as far as six feet below grade.

As we noted before, everybody's not suited to the consulting life.

Self Complacency Pulls The Rug

But consideration for others at all times, keeps it firm beneath our feet. For example:

A new consulting engineer, feeling pretty fat in his knowledge, was being considered by a manufacturing company for handling some extensive plant improvements. Among other items coming to his attention were three, 500-horsepower steam boilers, that, he decided, could be rescheduled in their operations to benefit the entire plant.

He said nothing whatever to the plant engineer about this contemplated rescheduling because, in the fatness of his knowledge, he regarded that individual's approval or disapproval as having no importance. And by this attitude, he violated one of the basic commandments for technical men which says:

"Thou shalt not take thy ideas first to the top, lest the bottom remove its support from thee, saying, 'It will not work.' "

AND of course the plant engineer, when asked by his employers for his opinion, found himself on the defensive for not suggesting similar changes long ago, and said: "It will not work. Not in our plant. This man is a book-and-paper engineer and no more. I've more than thirty years' experience."

Then the consultant committed another sin by losing his temper.

"Book and paper!" he shouted at the plant engineer, "I've designed and built boilers like these. I know what they can do and you don't. And you're too stubborn and set in your outdated ways to learn."

"Gentlemen," said the plant man patiently, "I am only interested in protecting your property and the lives of the people around me. If you adopt this scheme, I'll quit."

The consultant did not get the job. And over his desk he put a sign as a reminder:

"Thou shalt seek and respect the opinions of operators, even unto the third helpers, for theirs is a wisdom unknown to technicrats."

Humility, which is another word for describing consideration for the opinions and feelings of others, is an essential qualification for the successful consultant.

And Temptation Cometh

Sooner or later into every active office, there comes a manufacturer's representative, or a contractor's representative, who informs you that he is bidding on one of your jobs and before he submits his price:

"How much shall I put in for you, five or ten per cent?"

There is only one answer to this question: "Add nothing for me. Not now. Not ever. I am paid by my client, and I cannot and will not, work for two employers on the one job."

New consultants, fighting to keep going, may be sorely tempted to accept a kickback, "just once;" but that just once makes you forever suspect. The word gets around, you're marked as a man who can be reached if the price is right, and your position in the world is forever changed.

And again:

A contractor asks a registered engineer to sign a set of plans, drawn up by an employee of the contractor.

"I'm not qualified in that field," says the engineer.

"So what?" is the contractor's comment. "We know what we're doing. Your signature is nothing but a formality. We'll give you $50 to pay for your trouble and then you can forget it."

That morning the engineer's wife reported she needed some expensive medical treatment, and they were short of money. So the man put his name and his seal on the set of drawings, and it turned out the plans contained dangerous errors, and at last reports the state board of engineering examiners was considering the revocation of his license, and he may have sold his whole future for $50 profit on a "formality."

There is another form of temptation less bald than the two instances described, and more powerful in its appeal because, although no money is directly involved for the engineer, it occurs in the realm

Ethics cannot be compromised . . .

of loyalty to one's client. To observe such a situation, consider the case of the collapsed tank.

This tank was in the form of an immense drum, designed to store many thousands of barrels of gasoline as a unit of a tank farm, and the tank was brand new. In accordance with the terms of the tank contract, the foundation was the responsibility of the owner.

TWENTY-four hours before the tank was scheduled to go into service, it was given a water test; that is, it was filled to the roof, a procedure that took about twelve hours. And during the filling, rains came, and the impounded area inside the dikes was about a foot under water, and there was wind with the storm. And just after the water level in the tank reached the roof and the pumps stopped, the tank began to tilt, and in a few seconds the tilt became a capsize, and the tank collapsed releasing a flood that wiped out the dikes and several buildings nearby.

The owner claimed insurance on the grounds that the failure was the direct result of the winds and rains of the storm, and he called in his consulting engineer to examine the ruins and testify to the cause. But the consultant found beyond any question that the collapse was the outcome of a poorly made foundation, built up on a bed of muck and sand, and unable to support the weight of the tank when it was filled with water. In fact, he was able to duplicate the collapsing process with a model which came apart exactly as the tank had.

This engineer had no choice but to offer an opinion which was against the interests of his client. Fortunately, this client had respect for honesty when he saw it, and the engineer's relationship was continued; but we know of another case in which unfavorable testimony brought on the engineer's dismissal within forty-eight hours.

What caused the explosion that wrecked this four-apartment masonry building? Insurance companies are good clients on technical investigations.

Honor is the soul of ethics, and the man without it has no respected place in the profession. We cannot emphasize this fact too strongly.

New Consultants Are Easily Taken

The telephone is ringing and a voice says:

"I'm Joe J. Blow, the architect, and I'm looking for an engineer to prepare the design and specifications for a million-dollar tourist-hotel in the state next to yours. Are you available? If you are, I'm in town today, and I'll stop by and go over this with you."

Since you're struggling to establish yourself, you're half delirious with the prospect, and promptly invite Mr. Blow to have lunch with you—on you.

It just happens he has a set of preliminary architectural drawings with him, which he leaves with you, and he promises to send complete data and the answers to your questions as soon as he returns to his own office.

In due time, you receive more drawings and more data, and obviously this is to be a tourist-hotel to make tourists' eyes pop. You don't quite understand why such a fine commission came your way, being practically unknown. Of course you haven't received any money on account as yet—that is to come promptly after you submit your first set of drawings and specifications for the owner's approval.

You spend a month on the job, and submit all your material to Mr. Blow for comments, changes and approval, strictly as agreed. And you never hear from Mr. Blow again. Your letters come back marked: "No forwarding address." You try the telephone and learn service has been discontinued.

Who was Mr. Blow in reality? Where is your fine tourist-motel being built? You will never know, except by accident. You've paid plenty to learn what mothers have been hammering into their children's heads for centuries: Never trust strangers.

ALSO you will discover that a small percentage of your small clients, either because they can't or are coolly intending to defraud you, will never pay for your services. And it's not worth while to sue them. Even if you win, collection may be difficult or impossible, and you may find yourself with a reputation for being a shylock.

There is only one-half safeguard against finding yourself taken in the ways described. This safeguard, and not too strong a one, is to obtain a signed contract for your services and a down payment or retainer before starting work. This writer uses the contract form of the American Institute of Architects, modifying its terms to suit the job.

(Continued on page 42)

FROM WASHINGTON

BY
MILTON F. LUNCH,
N.S.P.E.'s Legislative Counsel

TAFT-HARTLEY PROFESSIONALISM: DEFINING THE DEFINITION

MUCH will be heard in professional circles the next several months about the "Western Electric Case." It may possibly rank with the Minneapolis-Honeywell Case of 1957 as a "landmark" in the contest between unionization and professionalism among engineers. Elsewhere in this issue, a news story relates some of the background of the present case. Of necessity, however, the news report contains only the bare bones of the case and little of its long-range significance to the engineering profession.

The Minneapolis-Honeywell election was a crucial test of the question whether engineers in industry could be sold on the idea of undisguised trade unionism (via the United Auto Workers, AFL-CIO). Neither the UAW, nor the other trade unions having an eye on engineers, have yet recovered from the resounding "no" vote of the engineers (as well as the technicians). The forthcoming election among engineers of Western Electric, nation-wide, may be of equal importance on the question whether engineers can be sold the idea of "professional" unionism.

The Council of Western Electric Technical (later changed to "Professional") Employees-National, ESA, was certified in 1952 by the National Labor Relations Board to represent the engineers and some technicians of the company. After negotiating successive collective bargaining contracts through November, 1955, the parties arrived at an impasse over the primary issue of the right of the company to assign personnel to occupations within the unit represented by the union, and the secondary issue of the interpretation of the definition of "professional employee" in the Taft-Hartley Act. Lawsuits and demonstrations failed to win for the union its claims that the company could assign to the jobs in the union's jurisdiction only those who were professional employees, as defined by the union. It's next gambit was something rare, if not unique, among labor organizations—a voluntary abandonment of the 1952 mixed-unit certification through the filing of a petition with the NLRB for a new certification, this time confined to professional employees.

The hearing before the New York office of the NLRB ran for over a year, and the record of testimony is almost 4,000 pages. Yet, despite this mass of record, the question now before the five members of the National Labor Relations Board is simply the application of the professional definition in the law to those employees who are in dispute between the parties as to their professional or non-professional status. It is assumed that the Board will, as usual, accept the stipulation of the parties disposing of the status of all the employees involved except for the 500 or so in dispute. Why, then, is the case really any more significant than the hundreds of others in which the Board has decided whether certain employees are or are not within the professional definition?

The answer to this question may well turn out to be that it is not any different or more significant. The union hopes, however, that the Board will use the case to enunciate broad and sweeping principles relative to the professional definition. Because this possibility exists, the United Auto Workers, and American Federation of Technical Engineers, both AFL-CIO, have filed briefs with the NLRB suggesting the importance of clear-cut distinctions between professional employees and technicians. At the request of both parties, NSPE has filed a brief which proposes principles the Board should follow in applying the professional definition, but not directly in support of either party. The NSPE brief points out that NSPE was one of the engineering societies originally responsible for the professional provisions in the labor law. "Although the instant proceeding is ostensibly only another case requiring Board interpretation and decision as to the eligibility of certain employees to vote as professional employees as defined in Section 2 (12) of the Act, the context and atmosphere in which it arises apparently raises broad and general issues as to the principles to be followed by the Board in construing the professional definition. *** The Society, accordingly, feels a vital and urgent necessity to present to the Board its comments and views . . . in the light of its initial sponsorship of the provision now in question . . . ."

The NSPE brief takes the position that the language of

the professional definition clearly makes the work performed the controlling factor. This can hardly be disputed in the light of the definition itself—"The term 'professional employee' means—

"(a) any employee engaged in work . . . (predominantly intellectual, varied, requiring the consistent exercise of discretion and judgment in its performance, non-standardized in relation to a given period of time . . .)."

Up to this point there cannot be too much sincere disagreement. The nub of the controversy lies in the fourth subsection of the definition, again referring back to the type of *work*: "requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study in an institution of higher learnings . . . as distinguished from a general academic education or from an apprenticeship or from training in the performance of routine, mental, manual, or physical processes . . . ."

To the union this language means that on an individual employee basis, the Board should hold for professional status if the person has a technical degree, or in the absence of a technical degree has the equivalent according to the union's private formula: 3 years of technical education and 2 years of engineering experience; between 2 and 3 years of technical education and 4 years of engineering experience, between 1 and 2 years of technical education and 6 years of engineering experience, 8 years of engineering experience, or a combination of technical education and 2 years of engineering experience coupled with 5 years of experience in an advanced technical or highly skilled job in a field closely related to professional engineering.

The NSPE brief recommends that individual determination of professional status be rejected by the Board, as it has been from the very first Board decisions on this point. It is pointed out that individual determinations among common employment groupings could lead to industrial chaos and would be contrary to the Congressional desire to promote harmony and stability in industrial relations. For example, individual determination as applied to a group of engineers with the same titles, same duties, same pay and a physical working relationship could easily result in some of the group being represented by a union, others not, or some represented by one union and the others by a different union. Part of the group would be classified as "professional" and the others as "nonprofessional," a situation hardly conducive to stability and harmony.

In NSPE's view, private formulae as to the meaning of the "advanced knowledge" language should carry no weight with the Board. Rather, it is suggested that the Board has properly always looked at the educational composition of the group as one of the factors to be considered, along with the nature and type of duties. In the recent *Westinghouse Air Brake* case, for example, the Board denied professional status to a number of engineering classifications on the ground that those in the various occupational groupings did not have technical degrees, even though many of the employees had had extensive technical training in night and special courses.

Members of the NLRB, l.-r.: Chairman Boyd Leedom, John H. Fanning, Philip R. Rodgers, Stephen S. Bean, and Joseph A. Jenkins.

In contrast, however, the NSPE brief notes the *Commercial Castings* case in which the Board accorded professional status to a group of tool designers, even though only twelve per cent had engineering degrees, there giving credit to academic courses "which are equivalent to engineering degrees."

To resolve this apparent conflict, and to indicate some guidelines for the future. NSPE's brief suggests that the Board could use the *Western Electric* case to establish the principle that to sustain a finding of professional status within the definition the occupational grouping should be composed essentially or substantially of those with technical degrees or, in the case of engineers, registration under state engineering registration laws, which the Board has recognized in past cases. It would be wise, the brief says, not to assign an arbitrary percentage figure, such as the obvious thought of requiring more than fifty per cent to have technical degrees or registration. Some flexibility should be allowed, it is suggested, the Board to determine each case under its own particular circumstances.

Whatever the outcome of the pending case—whether the decision is a "landmark" or a "dud," it will not be the end of the discussion as to the meaning of "professional." Rather, it may be the start of a new discussion which could well lead back to the source of the present dispute—the halls of Congress.

Focus On Hawaii

Hawaii's airy modern building styles are exemplified by this recently completed headquarters for the Board of Water Supply in Honolulu. The building is just one of many in the 50th state's booming construction industry.

ENGINEERING IN THE 50TH STATE

HAWAII, which will soon become the nation's 50th state, is still regarded by many Americans as simply a vacation paradise of beaches, pineapples, and grass skirts. But behind this popular concept, Hawaii stands as a modern bustling business community whose technological, social and civic development exceeds that of many mainland areas.

For the engineer, the new state appears certain to offer a wealth of opportunities for years to come. The Islands' population is growing, construction is at record levels and industry is coming in increasing numbers. And statehood seems likely to produce a new spur to the economic uptrend.

The engineer has always played important roles in Hawaii and much of the Islands' glistening 20th Century modernity stands as a monument to the advances of the profession. The engineer has provided the means for mechanizing the Islands' booming agricultural industry; he has pushed highways across and through rough volcanic terrain; he has developed water resources; provided new methods and materials in construction, and he has helped to provide better transportation facilities which have brought Hawaii closer to its supplies and markets.

Providing the technological advances necessary for Hawaii's development is no ordinary task. For Hawaii presents its own unique problems—limited land area, distances from sources of raw materials and markets, a tricky terrain. The Hawaiian engineer has often been called upon for the utmost in imagination to overcome these problems.

It is evident to even the most casual observer that the profession has met the challenge well. The engineer can claim a large part of the credit for the fact that Hawaii will bring into the union a well developed economy and a high standard of living. Utilizing an area little bigger than Connecticut and Rhode Island, Hawaii today generates a gross territorial product of $1,400,000,000 and an aggregate personal income of $1,145,000,000. Its per capita income of $1,821 ranks twenty-fifth among the states.

New and bigger demands for the engineer's skill and imagination will be made as Hawaii develops as a state. Statehood has focused a bright spotlight on the Islands and the attention is expected to stimulate the entire economy, bringing more population, more tourist trade and expansion of industrial activity.

Many of Hawaii's 800 registered engineers are playing active roles in the Islands' rapidly growing construction industry. Construction has been on a sharp upswing since 1955 and is currently one of the biggest growth factors. The dollar volume in construction was $68 million in 1954; the figure jumped to $94 million in 1955; to $113 million in 1956, and then to $135 million in 1957. Estimates for 1958 place the figure at near $200 million.

Dr. Thomas K. Hitch, research

Hawaii's Growth in the Fifties

	1950	1959 Estimates
Population	499,000	648,000
Labor Force	187,770	213,500
Personal Income	$689,000,000	$1,250,000,000
Manufacturing	$64,900,000	$115,000,000
Sugar	$124,000,000	$145,000,000
Pineapple	$97,400,000	$125,000,000
Construction	$67,700,000	$200,000,000

director for the Hawaii Employers Council, says construction should stay "way ahead of $100 million for the next half decade at least with a good chance that the business will top $1 billion in the next five to seven years."

SOME of the big projects currently underway or on the planning board include $100 million of Capehart military housing; a $40 million refinery for Standard Oil of California, and a $12 million shopping center. There are also plans for more improvements at Honolulu Airport, a new passenger terminal at the port, plus more residential and industrial units.

Highway construction, too, is enjoying a big boom. Highway construction awards hit a record high of $11 million in 1958 and may go higher in 1959. Contracts set for award this year will complete two cross mountain routes, the Nuuanu and Likelike highways. Also scheduled to come under contract are three more sections of the Lunalilo Freeway in Honolulu.

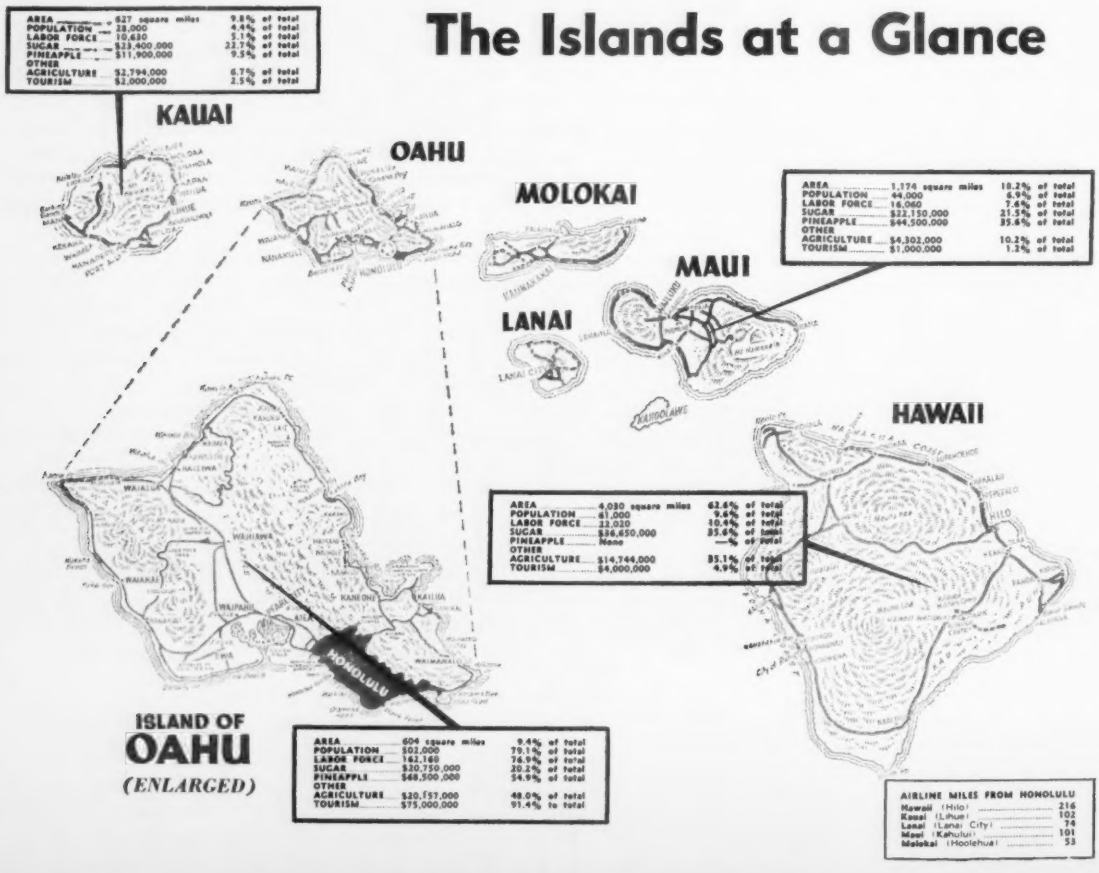
A major highway engineering achievement—the Koolau Tunnel project—is due for completion this year. Considered one of the territory's toughest jobs, the tunnel was cut through soft volcanic formation in the Koolau Mountain range at a cost of $3,845,352. The new tunnel parallels the already completed John H. Wilson Tunnel and the two bores will provide key links in the highway connection between Honolulu and the Kaneohe Bay area on the east side of the Island.

With two Senators and a Representative in Congress, Hawaii may be in a better position to get bigger chunks of Federal highway money. Islanders have been hoping for Federal help in plans for a 120-mile defense highway on Oahu Island. The project would cost between $120 and $200 million.

Hawaii's industry is still not large by mainland standards, but rapid strides have been made in that area since World War II. Between 1940 and 1956, manufacturing revenues increased from $12.5 million to $104.7 million—a 730 per cent hike.

With its high standard of living, Hawaii presents a healthy expanding market and there has been an apparent effort in recent years to meet the requirements of the market with local production rather than with imports. Mainland investments in manufacturing have shown a sharp increase in recent years as the potential of the Hawaiian market became evident.

The boom in construction has contributed to the improved industrial picture. Supply industries which have appeared in the wake



of the construction boom include Concrete Engineering Company, a $100,000 enterprise which manufactures prestressed concrete beams; Honolulu Wood Treating Company, capitalized at $130,000, and the Transit Mix Concrete Co., capitalized at $100,000.

Despite the new industrial activity, Hawaii remains to a large extent an agricultural economy. Pineapple and sugar are the two big money makers, accounting for $252 million of the Islands' exports in 1957. Hawaii's agriculture is highly mechanized thanks to constant improvements in the engineering field.

As an example of the technological improvements, the Hawaiian sugar industry today is turning out a greater tonnage with 17,000 workers than it did with 55,000 workers in 1932. And an engineering development—the invention of the Ginanca peeling and coring machine—marked the beginnings of large scale pineapple production.

Here's an aerial photograph of Honolulu showing two mountain routes leading from the city. Highway construction, like other building activity, is on the upswing throughout the Islands.

HAWAII'S mild uniform climate not only is good for pineapples and sugar cane, but it also gives a big boost to the tourist trade—another big money maker. Tourism has increased tremendously since World War II and has helped to spur the construction increase. From 1946 to 1957, the number of tourists coming to the Islands increased from 15,000 to 169,000 and the tourism income jumped from $6 million to $77 million. By 1962, the Islands may have more than a quarter of million visitors annually. Transportation improvements such as the institution of jet service are big factors in the industry's increase.

Hawaii's big military establishment has an important bearing on construction and the economy as a whole. In 1958, Armed Forces personnel numbered 49,000 and the military spent $324 million in the Islands.

The Bank of Hawaii, one of the Islands' big boosters, in a recent report, recognized the importance of technology to the future development of Hawaii:

"If the techniques, equipment and materials of twenty-five years ago were still in use today, Hawaii could not support its present population, much less its rising wage levels and living standards.

"Similarly, with present levels of technical efficiency, we could not support the expanding population of the next quarter century. Those who are pessimistic on this score overlook the creative power of scientific advances in methods, equipment and materials. Four and a half air hours to the mainland, for example, is already an assured reality. An atomic energy plant in Hawaii within less than a decade is under serious consideration.

"Rapid advances in the extraction of minerals and chemicals from sea water, as well as its purification for use, indicate that with the advent of more power these will become important industries. Continued advances in plastics, electronics, mechanization and personalized air transportation have far reaching implications for business growth. Other discoveries, not foreseeable today, will be realities in the everyday life of Hawaii a quarter of a century from now."—**End.**

Hawaii's engineering organizations are playing a big part in the Islands' growth. One of the newest is the Hawaii Society of the NSPE. Attending the formal presentation of the NSPE charter are, l.-r.: Ray M. Fuhrmann, 1960 president-elect; L. R. Durkee, NSPE vice president; J. Roberts Britton, Society president, and Cmdr. A. C. Bullen, Jr., national director of the Society.

Why Engineers Change Jobs in Industry

By
JOSEPH ALCABES, E.I.T.

Industrial Design Engineer, Bechtel Associates, New York, N.Y.

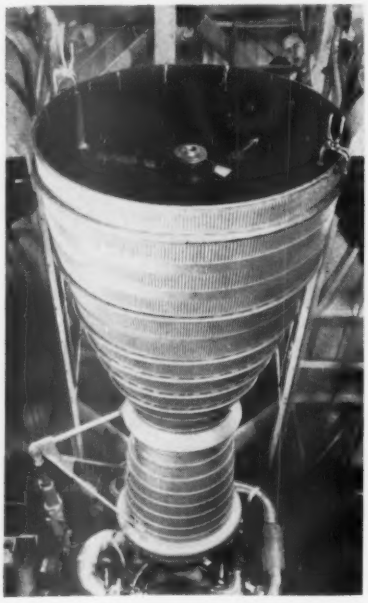
Of the estimated 633,000 engineers in the United States, approximately eighty per cent are employed by industry. The fact that these people are predominantly employees has caused a professional dilemma. Many appear to feel torn between their aims and aspirations in their employee status, and the compelling desire of recognition and treatment as members of a learned profession. No matter from what angle the situation is viewed, whether from the standpoint of management which must lead the engineers or from the standpoint of the engineer trying to develop a successful career for himself, there is a need for increased understanding of the human relations involved.

Much of the unrest that has occurred has been a result of the general dissatisfactions that the engineer has found with his profession. He feels that much can be done to improve the personal, the professional and the financial treatment of the engineer in industry. One of the few measurable evidences or expressions of dissatisfaction is labor turnover, that is, the hiring, separation, and replacement of employees. Not all turnover can be regarded as an expression of unrest, but its study can yield direct benefits in terms of understanding the problems and dissatisfactions of the engineers. If the turnover rate is increasing, it may at once become apparent, upon interpretation of such results, that employee dissatisfaction is increasing, and such findings may be a warning signal that trouble lies ahead.

Nation-wide accounting and reporting of separation and accession rates are provided for the basic industries by the Bureau of Labor Statistics of the United States Department of Labor. These statistics are available for industries as a whole, but they make no separation of engineers from other employees. Although there are over 633,000 engineers employed in some thirty industries, little has ever been done to measure their individual turnover rate. A study by Engineers' Joint Council, however, proves statistically that turnover is extremely high among engineers in industry. *The average annual turnover of all engineers in both industry and government was nine per cent for the year 1955. This means that some 60,000 engineers were on the move from job to job in 1955.*

When jobs are plentiful and manpower is scarce, the vehicle for mass turnover within an industry is almost ideal. Although turnover can and does occur for reasons other than an imbalance of supply over demand, the demand for engineers is a major factor to consider. For the past several years, our daily newspapers have proclaimed that technical jobs were plentiful and unfilled. Still other sources have claimed that there is not now, nor has there ever been, any critical shortage of engineers. It is important for us to determine the validity of this shortage before we can determine its effect on the turnover rates of engineering personnel.

According to the best available estimates, industry has need for approximately 40,000 new graduate engineers yearly. In 1956, the colleges of our country were able to supply approximately 30,000 engineers. This leads us to the conclusion that there is a shortage of some 10,000 engineers per year in all fields combined. There is a shortage, but there is little indication that it is accumulative because industry has learned somehow to perform satisfactorily with under-complements of engineering personnel. There is a shortage, but the shortage is not at all critical except in certain fields within certain localities. This gap between the supply and demand could easily be made up if the efficiency of our 633,000 engineers could be improved through better utilization by just one or two per cent. Turnover depends to a great extent on the ease with which engineers can move from job to job. The jobs have been available, but not nearly enough of them to justify the extremely high rate of turnover among engineers. To analyze the causes and effects of turnover, we must look to other than the shortage of engineers for justification.

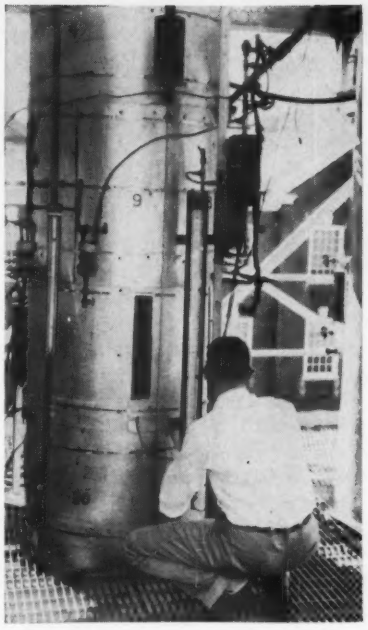


The author points out that some 60,000 engineers change jobs every year.

A LIMITED amount of turnover is necessary and desirable to insure the flow of new ideas to the engineering firm. Excessive turnover is unnecessary and undesirable, but it does exist much to the detriment of both employer and employee. Engineering turnover is particularly serious in industries and areas where the shortage of manpower is most acute. The shortage of engineers is an important factor in the study of turnover but it does not get at the causes of the problem. Engineers have used the availability of jobs, and the ease of relocation, as a vehicle for expressing their dissatisfaction with the engineering firms in industry. The reason for engineer discontent breaks down into three general areas of dissatisfaction. These are the financial, the professional and the personal treatment accorded the engineer in industry.

Salary levels, as they exist today, do not recognize the contribution of the professional engineer compared to that of other groups. Salary differentials between various levels of technical experience have been substantially narrowed during recent years. Engineers find that their salaries are only slightly higher than those of recent graduates, and possibly lower than those of a skilled craftsman. There has been a definite failure to recognize the inherent professional character of engineering work. Management has not used its professional employees to the maximum of their capabilities. Many engineers have been assigned to tasks which require a minimum of technical skill. In short, engineers are often hired to do the work of technicians. This retards the engineer in his professional development and denies recognition of his skill.

Engineers want to be classified as part of the management team, but many companies do not include them in this group. A lack of communications between top management and the lower echelon of engineers results in an incomplete understanding of company policies. Engineers have to understand the basic policies of their company in order to do a suitable job. They need to know their responsibilities and their opportunities for advancement. Adequate management-employee communications require a day to day relationship supplemented by periodic performance reviews and other appropriate techniques. Besides the failure to receive credit for his contributions, the engineer has been denied sufficient opportunity to attend trade shows and technical conventions. He has had little encouragement to become active or to take office in engineering societies as a registered member of a profession.



Today's salary levels, though improved, still do not reflect the contribution of the engineer in industry.

Another primary cause of excessive turnover has been the disappearance of the old personal relationship that once existed between the individual engineer and his employer. The engineer objects to being treated on a mass basis in hiring, training, and other employment situations. He wants to be treated as an individual and recognized as a member of an honored profession. In many companies, the engineer has no way to make his complaints known to management and to secure adequate redress. A great deal of turnover has been caused by the failure of management to minimize the fear of job insecurity by adopting feasible means for stabilizing the employment of professional personnel. Many companies have also failed to adopt suitable termination policies, thereby causing much dissatisfaction among our engineers.

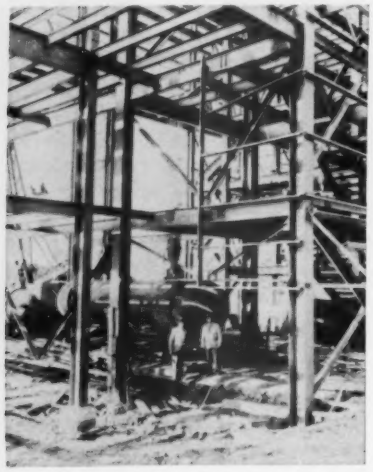
Forty-two per cent of the companies surveyed recently by the National Society of Professional Engineers reported that they found engineering turnover a problem in maintaining an efficient engineering staff. The writer has shown that the cause of excessive turnover among engineering personnel can be classified for careful analysis. By knowing the causes and the extent of the problem, we can be in a better position to provide some adequate solutions.

Excessive turnover lowers productivity and increases operating and administrative costs. It requires more extensive recruitment, selection and training of new employees, all of which may be expensive. Costs of an intangible nature are also important. It would be impossible to measure the effect of the insecurities, the frustrations and the low morale that occurs among engineering personnel as a result of excessive turnover. Former dissatisfied employees may be a source of ill will that frequently counteracts expensive advertising campaigns and prejudices recruitment.

A relationship between excessive turnover and unionization exists because both occur for the same reasons. The dissatisfactions that lead to turnover also cause the formation of collective bargaining units to represent the engineer in his dealings with management. Numerically, somewhat less than ten per cent of the nation's engineers are covered by collective bargaining contracts. This number is relatively small, but it could easily snowball in the event of a business recession or a mass advertising campaign by union leaders.

EXCESSIVE turnover is always a problem in industry, but because of its complexity, there is no one single solution. The causes, the extent and the effects of turnover vary considerably from firm to firm, and from industry to industry. It would be impossible to solve the

problem unless we could carefully analyze the conditions of employment, the nature of the business and the type of personnel of the specific firm. Management is primarily responsible for control of turnover, but it will discover no single, universally applicable cure. Reduction of an excessive rate of turnover is possible only when management becomes aware of the conditions which cause it and take corrective steps to alleviate these conditions. Awareness by management and its employees of the causes of turnover can be the first step in alleviating the problem.



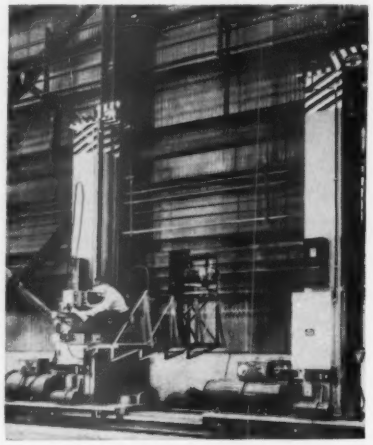
Excessive turnover of engineers is a major problem in many industries. Large projects, once started, are difficult to continue efficiently with newcomers.

In the cases where sound industrial relations are maintained, where employer and employees work closely together, there is usually found the lowest rates of turnover. Where employer and employees no longer regard the problems of the other, turnover rates are generally high. Traditionally, the relationship of engineers and management in American industry has been close and cordial. As the largest professional group in industry, engineers have long provided one of the most important sources of top management men. Accordingly, engineering staffs were in the past well informed on the management aims and long-range planning of their companies. For the past ten years, however, the size, complexity, and dispersion of typical engineering staffs have been steadily increasing. It has become more difficult for management to maintain the bonds of communication which inspire confidence and bring out the best in cooperation from their engineers.

It is the opinion of the writer that much of the problem has been caused by this breakdown in the relationship between engineers and management. The engineer no longer understands the problem of management because he is very often poorly informed insofar as basic company policies are concerned. Communications are poor despite the fact that surveys show that more than forty per cent of management were trained as engineers. It seems illogical, therefore, that often there is inadequate communications between management and engineers with consequent lack of understanding on the part of management of the reasons for dissatisfaction among professional employees.

Poor communications between professional engineering employees and management has been mentioned as a primary factor in almost every survey or discussion of employment relations. Some companies have developed outstanding programs of good internal communications between the two levels, but it is perhaps the greatest weakness existing today in industry as a whole. In striving to achieve an adequate employer-employee relationship, a dynamic program must be established that will speed a three-way inter-change of information—up, down, and across. Communication is the tool which enables employees to understand the motives and the actions of management, and for management to successfully carry out the objectives of the business.

How can the engineer in the field be kept informed and interested in major policy decisions back in the office?



Lack of communication between the engineer and top management is a major cause of dissatisfaction. The work of the engineer often takes him far afield of the administrative function.

Nevertheless, a program of improved human relations is only the first step, a broad general approach to the problem of turnover. It is important, but it must be coupled with further studies of the problems of utilization, economic remuneration and professional status. Firms which have been most successful in meeting problems of excessive turnover have been those which have kept records for analysis and control, made careful selection of new employees, and assigned them, after pre-induction training to the most suitable jobs. These firms preplanned their work, their personnel policies, and their employer-employee relationships in order to avoid the hazards of turnover.—End.

Reviewing A New Summary of

Fee Schedules and Manuals of Practice As Now in Use

Mr. Sanford

By

FRANK E. SANFORD, P. E.

Vice President, Commonwealth Associates, and Chairman, Fee Schedules Task Force, NSPE Functional Section for Consulting Engineers

FEE schedules or manuals of practice published by twenty-five state societies of professional engineers have been reviewed by a task force of the NSPE Functional Section for Consulting Engineers and a summary report is now being published by the Society. It is intended to be of service as a reference for use by committees engaged in preparing or revising these state society publications, and it may also be useful to consulting engineers with practice extending into several states.

The published manuals vary considerably in the amount of information made available for members. A majority have suggested definitions and outlines for scope of services in agreements, and other information, while others include only a schedule of suggested basic or average fee percentage rates.

Exchange of individual manuals and perhaps material in the NSPE summary will, it is hoped, encourage wider publication of the broader scope of information. The desirability of similarity and a degree of uniformity in these outlines of practice is apparent, particularly in terminology, definitions and general conditions.

Published Manuals Desirable

It is important that the scope of engineering services, as well as the bases of charges, should be clearly understood for each assignment. The need goes beyond the legal agreement itself—the general terms should be clear also to representatives and employees of the client who are associated with the engineer's work during the engagement.

A published booklet or manual for general use can be the most satisfactory method of acquainting the client and others with this information. It cannot, of course, take the place of a business discussion of the legal agreement—and it it not intended to replace any essential parts of an agreement.

The manuals of the state societies are concerned primarily with consulting and design engineering services relating to the construction of new facilities. Preparation of design drawings and specifications for the guidance of construction are the central service about which other services are developed.

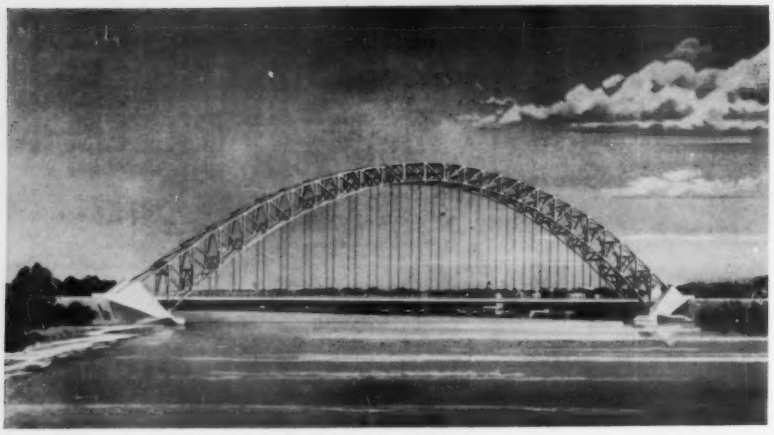
Preliminary consulting services also relating to construction—varying from preliminary sketches and estimates to feasibility studies and long-range development plans—are also recognized in the outlines. Similarly, services during construction may vary from consulting supervision to full-time resident engineering and inspection. Several modifications were noted in the references to these terms in some of the manuals.

Possible confusion in the terminology is indicated in a few schedules including, for example, "economic studies" and "advice as to feasibility" in the items covered by a percentage of construction cost fee. Charges for these services are ordinarily indicated on a separate basis and are not included in the percentage rate. Similar misunderstanding may follow in the outline of services during construction, with use of "nominal," "consulting," "resident," and "inspection" lacking full uniformity.

Charges for Services

Adequate compensation for professional services is in the interest of the client as well as engineers and engineering firms. Experience and special knowledge are essential to continued performance of engineering services, and provisions for salaries, office and other operating expenses and a fair profit are as

Use of Manuals of Practice . . .



Manuals of practice as discussed in this article can be most helpful in outlining costs of certain projects both for the use of the consulting engineer and the client. Above: A new D. B. Steinman bridge to be built in West Pakistan.

necessary here as in other good business relationships.

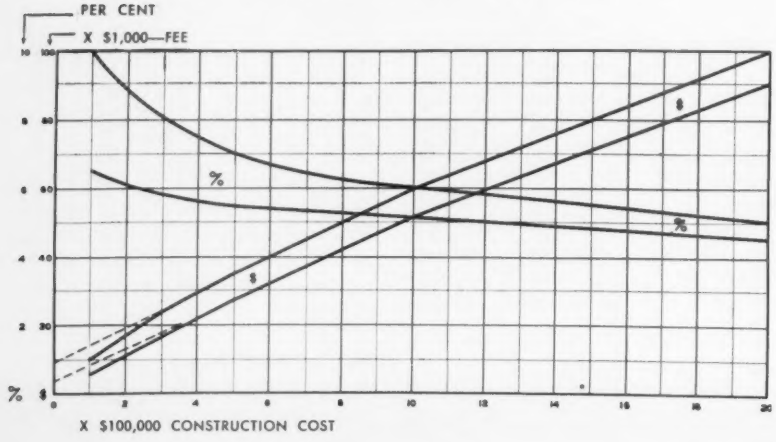
Manuals of practice can be particularly helpful in outlining these costs, both as a check list for the engineer and to clarify the items for the benefit of the client. There is, however, a wide variation among the published manuals in providing this information.

Direct or actual engineering cost based on time charged to the assignment, plus a percentage for overhead and profit, is commonly used for consulting services such as analyses and investigations, feasibility reports, comparison of plans, new developments, and similar studies.

CHARGES based on percentage of construction cost, or a lump sum based on an estimate of cost, are widely used for design engineering and associated consulting services.

Several modifications and combination of these two bases are usually outlined, including per diem rates for individual services, engineering cost plus a fixed fee and engineering cost for preliminary services plus percentage of construction cost for design services.

Basic Fee Schedules—Range of Values



Percentage rates published by the state societies and in the summary are intended as information to be of assistance in estimating and as a check for average conditions, which may or may not be duplicated in a particular situation. There is no intent to state any one set of rates, and considerable variation is to be expected.

Engineering Cost Basis

Engineering cost plus a percentage is considered the most equitable basis for charges for analyses and investigations, comparisons, etc., where the time required cannot be predetermined or the scope as outlined may be altered as the work progresses. It is then intended that the charges should be based on the actual time charged to the job and the salaries of individuals charging time.

There is some confusion in the published manuals in the terminology of salary and payroll costs and the place for charging "fringe benefits." Hourly or daily rates for employees of consulting firms may include in the base an allowance to cover direct costs associated with salaries, such as payroll taxes, insurance, vacation and holiday pay. The alternative frequently followed by consulting firms is to include these items with the general overhead for rent, light, supplies, administration of the business, etc.

Some of the state society manuals refer to "actual costs," others refer to "salary cost" and others to "payroll cost." Only six manuals include definitions and two of the definitions that are given differ from the other four. This is not surprising, since the accountants in their organizations do not appear to have formally adopted a nomenclature to cover these terms.

There is accounting background, however, for considering that salary should be treated as the recompense or the regular monthly payment for services (the equivalent of wages). Payroll cost is considered to be salary plus cost of specific items related directly to salary ("fringe benefits"). These costs add up to be a significant proportion of the "payroll cost."

The summary report includes definitions which are suggested for broader use. Although the same

final figure may result for charges to the client, the multiplier or percentage figure for "salary" must be considerably higher than for "payroll" cost.

Variation in Percentage Rates

For general construction of the types outlined by examples in the manuals, the use of percentage of construction cost as a basis for the estimating or determination of fees for design engineering services is well-established by general practice. The percentage rates are generally considered to include the services for (1) preparation of preliminary estimates and outline of project, (2) preparation of design plans working drawings and specifications, and (3) assistance in arranging contracts and consultation supervision during construction.

RATHER wide variation is apparent in the percentage values suggested in the various schedules of fees. Probably the major differences are due to the particular examples considered as "average" or typical in reviewing the costs. It is to be expected that the experience represented in the various committees and in surveys in different areas would result in differences in the typical cases and the resulting average percentages considered.

The accompanying chart shows a band of the percentage rates based on the state society suggested schedules. The engineering fee rates differ most widely at the lower values of construction cost and tend to approach closer similarity at higher construction costs.

A further observation leads to a suggestion in the summary. It is noted that the engineering charges resulting from application of these various rates are in a band between lines that are very nearly straight, with a constant rather than a variable difference in charges. Extension of the curves for charges, as shown dotted on the chart, points to a possible simplification of the schedules of percentage rates that is recognized in some of the schedules.

Fee schedules, stated in percentage rates, attempt to reflect two important components of engineering cost: (1) An initial cost which is relatively independent of the exact size of the project; (2) The costs for engineering design and for consultation during construction, which generally increase in direct relationship with the size of the project. Small steps and the need to interpolate percentage values result from addition of the initial cost to the direct percentage values for design for varying amounts of construction cost.

Block step type rates or two-part fees are suggested in a few recently published state society manuals. The summary report suggests the more extensive adoption of one of these methods as a means of simplifying and clarifying the percentage of construction cost fee schedules. It means simply that the initial cost for the preliminary work is covered by a lump sum or actual cost plus percentage charge, and the design services are covered in the percentage of construction cost charges. *(See below for instructions on how to order the Summary Manual.)*—End.

Consulting Engineers:

Summary Booklet Now Available

This summary of Manuals of Practice and Schedules of Fees is basically a compilation of information published by the several state societies of professional engineers. It is intended to be of service as a reference to assist in future revision or preparation of manuals and schedules and, of course, to individuals in the practice of consulting and construction engineering which extends into several states.

The initial purpose was to determine similarities and differences in the outlines of services, classifications and percentage rates of fees based on construction cost. The many results of individual group deliberations are represented in these manuals and they were to a considerable degree prepared in a new field so that numerous variations are to be expected.

NSPE Members, 50¢ each Non-Members, $1.00 each

Quantity Prices Available

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
2029 K STREET, N. W., WASHINGTON 6, D. C.

Please send me ..... copy(ies):

Summary of Manuals of Practice and
Fee Schedules for Consulting and Design Engineering

I am enclosing $.....

Name.....

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(Please make checks payable to: National Society of Professional Engineers)

New Literature

FUSIBLE SYSTEM—Bulletin 1-215 has been issued by Federal Pacific Electric Company in conjunction with the introduction of its new line of Type SF fusible service equipment. Detailing the entire stab-in fusible system, this 12-page catalog covers stab-in units, enclosures, features and accessories. Features covered in detail are combination flush/surface mounting, locking clips on stab-in units, insulated groundable neutral, bus bar arrangements, two-way pressure stabs, UL approved lugs for copper and aluminum conductors, narrow-width, shallow-depth enclosure construction, and the use of the system as an off-peak water heater device. Application information includes technical data and wiring diagrams. Bulletin 1-215 also contains information on interchangable hubs, adapter frames for extra trim overhang, and other accessories.

(Circle 15 in Readers' Service Dept.)

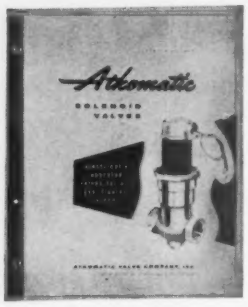
SPACE RESEARCH—How General Electric conducts its research and development work on missiles and space vehicles is explained in a new, 28-page booklet. Covering the major areas of organization, facilities, capabilities, current projects, and other activities, the booklet shows how a modern research and development organization must equip itself for work in the ultra-modern area of missile and spacecraft research and development.

(Circle 16 in Readers' Service Dept.)

COMPUTER—"Organizational Problems Encountered in Setting Up a Computer" is the title of a bulletin being made available by Bendix Computer Division, Bendix Aviation Corporation. It describes solutions to numerous problems that confront an engineering organization in the civil engineering field when contemplating the use of an electronic computer, and concludes with a brief explanation of the results the firm experienced with their G-15 computer.

(Circle 17 in Readers' Service Dept.)

SOLENOID VALVES—Atkomatic's new catalog #444 lists their complete line of over 200 solenoid valves of bronze and stainless steel construction. Valves are available for use with pres-



sures from 0 to 10,000 PSI and temperatures from —300° to +500° F. and may be used for air, steam, corrosive and non-corrosive gases and liquids. The 36-page catalog gives detailed valve specifications, performance data, specific application information and optional features. Cutaway drawings are used to identify valve parts and illustrate valve operation. All material is organized and presented in such a manner as to be of maximum assistance to the equipment and systems design engineer. Prices are included to simplify cost estimating.

(Circle 18 in Readers' Service Dept.)

STEEL ALLOYS—The eighth in a continuing series of design bulletins published by United States Chemical Milling Corporation has just been made available. Directed at designers as well as production engineers concerned with uses of steel alloys, Design Bulletin No. 8 is the first important technical information available describing recent advances in the state of the art of chemically milled steel alloys. The bulletin gives information of the effects of heat treating, surface finishes and tolerances, effect on physical properties, and an up-to-date list of the many steel alloys and other super hard metals that now can be chemically milled.

(Circle 19 in Readers' Service Dept.)

TESTING APPARATUS—A "new-products" bulletin is now available which describes ten recently developed items that have been added to the line of testing apparatus manufactured and distributed by Soiltest, Inc. Included in the list of items are apparatus for concrete, soils and asphalt testing, as well as the Soiltest Beggs Deformeter for solving problems involved in the design of indeterminate structures. For concrete testing are a portable tension-compression tester and the CT-600 moisture-humidity tester for masonry blocks. Soil testing equipment includes the sand equivalent test set, the Levermatic Consolidation Apparatus, a British style Recording Unconfined Compression Tester, a Standard Liquid Limit Device, and the 200-ton Loading Ram for performing bearing capacity tests under static loads. There are two items of equipment described for asphalt testing: the C-50 heated universal mixer, as well as a non-heated version of the same mixer, and the new fully automatic electro-hydraulic kneading compactor.

(Circle 20 in Readers' Service Dept.)

RECORDING TAPE—"How to Measure Time With Tape," a 12-page full color brochure on the advantages of using magnetic recording tape as a dictating medium, has been prepared by the DeJur-Amsco Corporation. The brochure describes claimed advantages of magnetic tape dictation over other methods, particularly the economy of tape, erasability, fidelity, and the electronic correction of errors directly on the medium.

(Circle 21 in Readers' Service Dept.)

COVERING—A 12-page illustrated brochure on Styrofoam pipe and vessel covering applications for low temperature insulation has been published by The Dow Chemical Company. The brochure presents a variety of engineering data, recommended application techniques and charts on recommended thicknesses and heat gain.

(Circle 22 in Readers' Service Dept.)

These listings are informational only and are not an endorsement of the products, nor of the manufacturer's claims. To receive any of the new literature described in this column, merely circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

William F. Ryan Selected As 1959 NSPE Award Winner

- Presentation at Silver Anniversary Meet
- Complete Program Listed for June 17-20

Presentation of the 1959 NSPE Award for outstanding service to the profession will be made to William F. Ryan, former vice president of Stone & Webster Engineering Corporation, at the Society's Silver Anniversary meeting in New York City, June 17-20.

The ninth individual to receive the Award since it was first made in 1949, Mr. Ryan will be honored

William F. Ryan

at the annual banquet on June 20. Other recipients were: Herbert Hoover, 1949; David B. Steinman, 1952; Charles F. Kettering, 1953; Harry A. Winne, 1954; A. A. Potter, 1955; Donald A. Quarles, 1956; Granville M. Read, 1957, and Nathan W. Dougherty, 1958.

Mr. Ryan joined Stone & Webster in Boston, Mass., in 1929 as a mechanical engineer. He assumed the duties of engineering manager in 1948—advancing to the vice presidency in 1950. He also served as a director of the corporation prior to his retirement last year.

Long active in professional group activities, Mr. Ryan is a former vice president and national director of NSPE as well as a past president of the American Society of Mechanical Engineers, and the Massachusetts SPE. He has served as chairman of several National Society committees.

He was a member of the Engineers Council for Professional Development from 1951 to 1956, and took a leading role in the development of the Canons of Ethics through his work on ECPD's Ethics Committee. He served as both a member and chairman of the Committee.

A graduate of Harvard University, Mr. Ryan is the author of numerous papers on power, engineering economics, and professional ethics.

Functional section meetings, a panel discussion on "The Merging Role of Engineering and Science," and the regular professional sessions will all play a prominent part on the program for the special 25th annual meeting.

Many important committee reports covering a wide range of topics will be presented to the Board. Of special interest will be reports on the broadening of the student contact program, field activities on engineering unionization, increasing concern for ethics, and the effect of the labor reform bill on P.E.'s in the construction industry. A new public relations manual will also be shown to the Board for their approval.

The formal Board opening for the four-day affair at the Hotel Commodore is set for Wednesday, June 17, at 2 p.m. The Executive Committee will get together on Tuesday for an all day meeting and again Wednesday morning.

The Honorable Robert F. Wagner, mayor of New York, will give a welcoming address at the Wednesday dinner. Other highlights during the evening will include the "State of the Society" message by Dr. Clark A. Dunn, NSPE president; remarks by Granville M. Read, recently retired chief engineer of E. I. du Pont de Nemours and Company, Inc., and the announcement of the NSPE "Ambassador," chosen in conjunction with the Society's fund campaign.

Functional Section meetings of interest to engineers in private practice, government, and industry-education are planned for June 19.

James P. O'Donnell, vice chairman, Northeast Region, Functional Section for Consulting Engineers in Private Practice, will moderate the meeting on "Practice Problems of the Consulting Engineer." Participating in the discussion will be Harvey Pierce, consulting engineer, Miami, Fla.; J. L. Breeze, J. L. Breeze Associates, Sante Fe, N. Mex.; Frank E. Sanford, Commonwealth Associates, Inc., Jackson, Mich., and Frederick Von Voigtlander, national director from Michigan who will present a paper on behalf of the Michigan SPE.

Wesley E. Gilbertson, vice chairman, Northeast Region, Functional Section for Engineers in Government Practice, will moderate the meeting on "Civil Service Classification and Legislation Affecting Engineers in Government Practice." Panelists will include Seymour Berlin, assistant bureau chief of Inspection and Classification, Civil Service Commission; C. Mansel Keene, chief of Standards, Civil Service Commission; Raymond J. Braitsch, Department of the Army Wage Board, and Milton F. Lunch, NSPE legislative counsel.

Otto Mald, chairman, Functional Committee for Engineers in Public Service of the NYSSPE, will moderate a session on "Employment Problems of Engineers in Government Practice." Participants will be Leigh E. St. John, St. John, Platt & Carlson, Binghamton and Buffalo, N.Y.; John T. Dollard, senior assessor, Public Utility Bureau, NYC Tax Department; Frank J. Durkin, member of New York

To Participate in Panel Discussion

A panel discussion on "The Merging Role of Engineering and Science" will include these participants: Clarence H. Linder, left, vice president of General Electric Company; James F. Fairman, center, senior vice president of Consolidated Edison Company of New York, Inc., who will moderate the discussion, and John C. Calhoun, vice president for engineering, Texas A&M College.

Bar, and Henry G. Vermont, chairman, Functional Section of Engineers in New York City Public Service, NYSSPE.

In the industry-education section, H. P. Cooper, chairman, Engineers-in-Industry Subcommittee, will moderate a meeting on "The Conservation of Engineering Brainpower." Taking part in the panel discussion will be Dr. Warren C. Stoker, director, Hartford Graduate Center, Rensselaer Polytechnic Institute; A. C. Friel, chairman, Committee on Engineering Technicians, and Dr. William Torpey, Office of Civil and Defense Mobilization, Washington, D.C.

Following these functional section meetings on Friday, J. Carlton Ward, Jr., president, Vitro Corporation of America, will speak to the group at a luncheon on "The Merging Role of Engineering and Science for our Technological Economy."

This talk will set the stage for the afternoon panel discussion on the merger of engineering and science. James F. Fairman, senior vice president of Consolidated Edison Company of New York, Inc., will moderate the session. Clarence H. Linder, vice president of the General Electric Company, will discuss the merger as it affects industry, while John C. Calhoun, vice president for engineering, Texas A&M College, will speak for education.

Past presidents of the Society will be honored at a luncheon on Saturday. The first president of NSPE, Dr. David B. Steinman, will talk, and the official twenty-five year history of the Society will be distributed.

The annual banquet is set for 7 p.m. Saturday, and will be highlighted by the presentation of the NSPE Award to Mr. Ryan. Installation of 1959-60 Society officers is also scheduled for this time.

Varied social activities have been arranged for both members and their wives, including a "Mixer Party" on Thursday evening. Many prizes will be given out at this event, plus refreshments and entertainment.

Franklin J. Johnson, chairman of the Silver Anniversary Meeting Committee, reports that the following program may undergo some minor revisions.

Working closely with Mr. Johnson has been the New York State SPE Meeting Committee, chairmaned by Carl H. Reker. Serving as vice chairmen are John J. Lanigan and George T. Baer.

The NYSSPE will hold its annual meeting all day Saturday.

Here's the Program:

TUESDAY, JUNE 16, 1959

9:00 a.m.—5:00 p.m. Executive Committee Meeting

WEDNESDAY, JUNE 17, 1959

9:00 a.m. Executive Committee Meeting

2:00 p.m. Formal Opening of Twenty-fifth Annual Meeting with Professional Meeting

6:30 p.m. Board of Distinguished Consultants Dinner

Welcoming Address: Honorable Robert F. Wagner, Mayor, City of New York
Remarks: Granville M. Read, P.E., Chief Engineer, ret., E. I. du Pont de Nemours and Co., Inc.
Address: Clark A. Dunn, P.E., President, NSPE, "The State of the Society"
Announcement of NSPE Ambassador

THURSDAY, JUNE 18, 1959

9:00 a.m. Professional Meeting

Noon Regional Luncheons
2:00 p.m. Professional Meeting
Evening Mixer Party—Entertainment

FRIDAY, JUNE 19, 1959

Functional Section meetings are as follows:

GOVERNMENT

Chairman: Leonard D. White, P.E.
Chairman, Functional Section for Engineers in Government Practice

8:30 a.m.—9:45 a.m.—Civil Service Classification and Legislation Affecting Engineers in Government Practice
Moderator: Wesley E. Gilbertson, P.E.
Panelists:
Problems in Classifying Engineering Positions
Seymour Berlin
Establishing Professional Engineering Standards
C. Mansel Keene
Engineering Aspects of the Interdepartmental Committee on Civilian Compensation
Raymond J. Braitsch
Advancing Professional Engineers' Status Through Legislation
Milton F. Lunch

9:45 a.m.—11:00 a.m.—Employment Problems of Engineers in Government Practice
Moderator: Otto Mald, P.E.
Panelists:
Responsibility of the Professional Society for Engineers in Government Employ
Leigh E. St. John, P.E.
Ethical and Professional Problems Created by the Mayor's Executive Order No. 49
John T. Dollard, P.E.
Legal Problems in Serving the Needs of Government Engineers Through the Professional Society
Frank J. Durkin, P.E.
Development of the Functional Section of Engineers in New York City Public Service
Henry G. Vermont, P. E.

INDUSTRY-EDUCATION

Chairman: W. L. Hindermann, P.E.
Vice President, Professional Employment Group

9:00 a.m.—Noon—The Conservation of Engineering Brainpower
Moderator: H. P. Cooper, P.E.
Panelists:
Realizing the Highest Potential of Engineers in Industry Through Advanced Education
Dr. Warren C. Stoker
The Role of Technicians in Conserving Engineering Brainpower
A. C. Friel, P.E.
Lessons of the Engineering Utilization Conferences
Dr. William Torpey

PRIVATE PRACTICE

Chairman: Leslie C. Gates, P.E.
Chairman, Functional Section of Consulting Engineers In Private Practice

9:00 a.m.—Noon—Practice Problems of The Consulting Engineer
Moderator: James P. O'Donnell, P.E.
Panelists:
The Functional Section in Proper Perspective
Harvey Pierce, P.E.
Duties and Responsibilities of a Principal in a Consulting Engineer Firm
J. L. Breeze, P.E.
Let's Be Realistic on Fee Schedules
Frank E. Sanford, P.E.
Ways of Presenting the Consulting Engineer's Story
Frederick Von Voigtlander, P. E.

LADIES PROGRAM

Wednesday—June 17, 1959

Afternoon.....Afternoon Tea and Get-together
Evening.....Board of Distinguished Consultants Dinner with men

Thursday—June 18, 1959

Morning.....Breakfast and Fashion Show at B. Altmans
Afternoon.....Sightseeing boat trip around Manhattan Island
Evening.....''Mixer Party'' for all

Friday—June 19, 1959

Morning.....United Nations Tour
Afternoon—a) Luncheon with men
—b) ''Your-on-your-Own'' time (TV-Radio, etc. Tickets available)
Evening.....Unscheduled (Reservations available for ''The Music Man'')

Saturday—June 20, 1959

Morning.....National Ladies Auxiliary meeting
Afternoon.....''Past Presidents'' Luncheon with men
Evening.....Cocktail Party and Banquet with men

Following the presentation of each of the papers, a formal comment paper will be presented. There will be a general floor discussion following each paper.

9:00 a.m.—Annual PECBI Meeting

12:30 p.m.—Luncheon

Speaker: J. Carlton Ward, Jr.
President, Vitro Corporation of America
''The Merging Role of Engineering and Science for our Technological Economy''

2:30 p.m.—The Merging Role of Engineering and Science

Moderator: James F. Fairman, P.E.
Senior Vice President, Consolidated Edison Co. of New York, Inc.

The Merging Role of Engineering and Science in Industry
Clarence H. Linder, P.E.
Vice President, General Electric Company

The Merging Role of Engineering and Science in Education
John C. Calhoun, Jr., P.E.
Vice President for Engineering, Texas A&M College

SATURDAY, JUNE 20, 1959

9:00 a.m. Continuation of Professional Meeting

Noon Past Presidents' Luncheon. Everyone invited
Address: Dr. David B. Steinman, P.E., First President of NSPE

2:30 p.m. Continuation of Professional Meeting
Meeting of Delegates
Adjournment

Ohio Society Elects Borton as President

The Ohio Society of Professional Engineers has installed Homer T.

Homer T. Borton

Borton as its new president for 1959-1960.

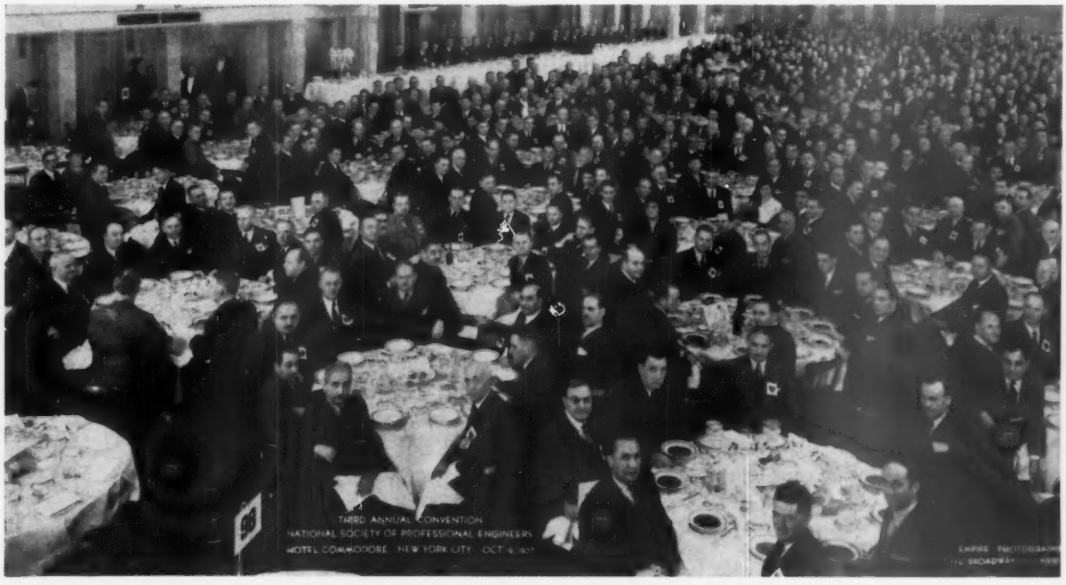
Assuming other OSP posts—announced at the Society's annual meeting in Toledo—are: Wayne E. Ault, vice president; George E. Hecox, vice president; Wayne H. Kuhn, vice president; Stuart E. Withers, secretary, and George W. Brandt, treasurer.

6:00 p.m. Cocktail Party

7:00 p.m. Banquet

Installation of 1959-60 NSPE Officers
Presentation of NSPE Award to William F. Ryan, P.E., Vice President, (ret.), of Stone and Webster Engineering Co.

A scene from NSPE's 1937 annual meeting is shown below. This year's Silver Anniversary meeting will be held in the same city, New York, and the same place, Hotel Commodore.



Thoughts on Professionalism...

By PAUL H. ROBBINS, P.E.
NSPE Executive Director

NSPE National Meetings

ALL organizations are, of course, concerned with the conduct, programming, and attendance of their meetings. NSPE is no exception, for meetings provide the opportunity for the membership to both express their desires to committees, boards, and officers, as well as become informed of the things the Society is doing on their behalf. Of deep concern to those vitally interested in the Society's programs, however, is the fact that only a comparatively small number of the members attend any Society meeting and even fewer attend regularly.

ANOTHER professional organization recently distributed a questionnaire to those in attendance at one of their national meetings and found quite surprisingly that nearly eighty per cent of those attending confessed that the impelling attraction was the opportunity to meet others in the profession, renew old friendships, and enjoy the social events provided. Next in order of importance, they reported was the program, its speakers, and the planned discussions. In commenting on this study, it was pointed out that experience of other groups had not followed this pattern.

NSPE meetings are different from other organizational meetings, particularly in the engineering profession. One difference, of course, is that all of the discussions at an NSPE meeting are nontechnical and concern the basic problems with which the engineering profession is faced. A second distinction is that while the meeting is conducted in such a way that policy may be established or the Society programs authorized, the discussions are open to all members; and within the time limits available, any member is permitted to express his opinion upon the item under discussion.

IT is unfortunate that this facet of NSPE's programs is frequently misunderstood. Because the basis for discussion is usually a somewhat detailed committee report which has been distributed previously to state society representatives, members attending the meetings sometimes feel too much has preceded the discussion for them to be fully informed. To the contrary, however, most topics under discussion have been under consideration at state and chapter levels for a period of time and often additional points have been raised from these discussions which would contribute to a better understanding of the problem by all concerned.

MUCH effort, of course, goes into the planning of national meetings. Bringing together as they do representatives of the fifty state societies from all corners and territories of the United States, and having the advantage of the research laboratories that exist in the committees, and at the chapter and the state level, the national meeting provides a synthesis of thought which cannot help but be stimulating to all who attend.

WITH the twenty-fifth anniversary meeting in New York in June being in a location to which a large portion of our members can travel by car and which many others will wish to visit as a part of their vacation plans, it is hoped that more engineers than ever before will have an opportunity to participate in the thoughtful discussions which will be engendered and the pleasant acquaintanceships and social events which this meeting will provide.

CONSULTING

(Continued from page 26)

However, getting a signed contract from people who are not used to such things, is sometimes difficult; they suspect something might be written in invisible ink, and the new consultant, holding his breath to get a job, dislikes pushing the point.

The pain is greatest in the first couple of years of practice, for this is when you need your pay the most.

Is There A Golden Age For Starting?

We think there is; between birthdays forty and fifty. By this decade maturity of thought and attitude has been achieved, and the new consultant is armored with at least ten years' experience in his specialty. Also he still possesses enough of the bounce and enthusiasm of youth to survive the demands and troubles of his new responsibilities.

After fifty, energy tends to wilt a bit, and the average engineer who has been on somebody's payroll to that age, may have so heavy a stake in his employer's pension plan, that he cannot afford to drop it. He must face the fact that his productive life has shrunk to fifteen or twenty years at the most, and that is not a long time for building up a new financial security.

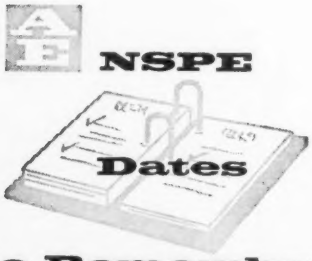
Some individuals may feel that "being on my own" will be easier, during the declining years. This can be true—provided you are able to pick your jobs—and must not accept all the grist that comes in, in order to live. And never forget that your wife will continue to want new hats, and you'll be expected to contribute liberally as a man with his own business, to all sorts of community projects. You have a position when you're on your own, that is not always maintained cheaply.

Do you feel you satisfy the requirements for starting your own office as sketched in this article? Yes? Then go ahead, and the best of luck to you. But never forget—everybody is not suited for it.—**End.**

Charter Presentation Set for Montana Chapter

A charter presentation is planned this month for the Billings Engineers Club-Midland Empire Chapter of the Montana Society of Engineers.

Officers of the new Chapter are: Fred B. Bowman, president; Sam B. Ward, secretary, and Charles L. Wilson, director.



to Remember

Illinois Society of Professional Engineers—Annual Meeting, April 30-May 2, 1959, Rockford, Illinois.

New Jersey Society of Professional Engineers—Annual Meeting, May 1-2, 1959, Ambassador Hotel, Atlantic City, New Jersey.

Connecticut Society of Professional Engineers — Annual Meeting, May 9, 1959, Oakdale Tavern, Wallingford - New Haven, Connecticut.

Maryland Society of Professional Engineers—Annual Meeting, May 12, 1959, Friendship Airport, Baltimore, Maryland.

Pennsylvania Society of Professional Engineers — Annual Meeting, May 14-16, 1959, George Washington Hotel, Washington, Pennsylvania.

California Society of Professional Engineers—Annual Meeting, May 22-23, El Dorado Motel, Sacramento, Calif.

Montana Society of Engineers—Annual Meeting, May 23, 1959, Finlon Hotel, Butte, Montana.

District of Columbia Society of Professional Engineers — Annual Meeting May 25, 1959, Presidential Arms, Washington, D.C.

Michigan Society of Professional Engineers — Annual Meeting, June 12-13, 1959, Gratiot Inn, Port Huron, Michigan.

Indiana Society of Professional Engineers — Annual Meeting, June 12-13, 1959, French Lick Hotel, French Lick Springs, Indiana.

South Carolina Society of Professional Engineers — Annual Meeting, June 12-13, 1959, Poinsett Hotel, Greenville, South Carolina.

National Society of Professional Engineers—Annual Meeting, June 17-20, 1959, Commodore Hotel, New York, New York.

Professional Engineers of North Carolina — Summer Meeting, June 18-20, 1959, Sedgefield Inn, Greensboro, North Carolina.

Missouri Society of Professional Engineers — Annual Meeting, June 26-27, 1959, Robidoux Hotel, St. Joseph, Missouri.

National Society of Professional Engineers—Fall Meeting, October 15-17, 1959, Penn-Sheraton Hotel, Pittsburgh, Pennsylvania.

Two-Day State Presidents' Conference Held at Purdue

- Forty-Two State Societies Represented
- Dr. Morgen Speaks on USSR Education

Forty-two states were represented at NSPE's recent State Presidents' Conference at Purdue University in Lafayette, Indiana.

The two-day affair opened with Dr. Clark A. Dunn, Society president, explaining the purposes and objectives of the conference. Executive Director Paul H. Robbins briefly outlined administrative procedures and publications of the National Society to the assembled group.

Following these talks, the presidents split up into smaller groups which were presided over by NSPE's regional vice presidents.

One of the highlights of the conference was a banquet talk by Dr. Ralph A. Morgen, director of the Purdue University Research Foundation, who spoke on "Engineering Education in Russia." Dr. Morgen was a member of an eight-man mission from the United States who recently visited the USSR to gain firsthand knowledge of their educational program.

All meetings were held in the new $10-million annex to the Purdue Memorial Union.

Dunn and Speaker

Dr. Clark A. Dunn, left, National Society president, is shown with Dr. Ralph A. Morgen, banquet speaker, who told of his visit to the Soviet Union to inspect their educational program.

Easley Talks to Presidents

NSPE Vice President L. Eugene Easley addresses the society presidents at the recent conference. To the right of Mr. Easley are, l-r: President Dunn, National Director Henry Estergreen, and Frederick Morse, Indiana SPE president.

Harry G. Kennedy, Former NSPE Vice President, Dies

Harry G. Kennedy, of Charleston, West Virginia, who served two terms as vice president of the National Society, died recently after an extended illness. Since 1941 he had served as executive secretary of

Harry G. Kennedy

the Kanawha Coal Operators' Association.

Mr. Kennedy, 55, held the office of NSPE vice president from the Central Region from 1956 to 1958, and had also served as a national director. He was a past president of the West Virginia SPE.

A graduate of West Virginia University, he co-authored that school's Research Bulletin No. 4, "Mining Methods in West Virginia."

In 1944 he was labor consultant to Secretary of the Interior Harold Ickes.

Mr. Kennedy was active in a number of professional and civic organizations. He served as chairman of the Coal Producers Committee for Smoke Abatement, and as chairman of the Advisory Committee on Scientific, Engineering, and Specialized Personnel for the Selective Service System in West Virginia.

A former president of the Charleston Rotary Club, he was an elder in the Presbyterian Church, a Yoke Fellow, a Shriner, a director of the YMCA, a member of the Kanawha County Board of Education, and a memer of Kappa Sigma and Sigma Gamma Epsilon.

Other recent deaths:

Hardy Cross, of Virginia Beach, Virginia, member of Viginia Society of Professional Engineers.

Victor M. Ehlers, of Austin, Texas, member of Texas Society of Professional Engineers.

Carl M. Gilt, of Princeton, New Jersey, member of New York State Society of Professional Engineers.

Edwin S. Osteyee, of Stratford, Connecticut, member of Connecticut Society of Professional Engineers.

Paul H. Robbins, of Reading Pennsylvania, member of Pennsylvania Society of Professional Engineers.

LETTERS

(Continued from page 6)

demonstrating the good judgment of the people in *scientific* matters? Except where the public judgment is derived from that of the professional scientists (when they are essentially of one mind as in the case of fluoridation), only the dearth of such evidence is apparent.

Certainly, there are two sides to the fluoridation question. After my experience a few years ago in reading and hearing both sides I came to accept the pro-fluoridation data and the conclusions as scientifically gathered and derived instead of accepting the anti-fluoridation emotional tricks (fluoridation is a communist plot), pseudo-scientific hogwash (the fluoride ions in naturally fluoridated water differ from those in artificially fluoridated water), half truths (degenerative diseases are on the increase where water supplies are fluoridated, neglecting to say the same is just as true elsewhere), etc., ad infinitum, without presenting the results of a single soundly conceived and executed study demonstrating the pro-fluoridation argument to be of at least questionable validity.

The non-engineering material presented by Engineers Romer and Martin gives background sketch of the whole situation and shows important interests and public responsibilities common to professional engineers and life scientists. What is so unprofessional about that? The critics have not offered one shred of evidence that the figures and statements offered by the authors are unreliable, are merely opinions, or are false! Most of the nine references given can be readily checked; the critics clearly have not bothered to do so!

DONALD W. GRUNDITZ, P.E.
W. Peabody, Mass.

By Mrs. Garvin H. Dyer, Chairman of the Ladies Auxiliary Advisory Committee.

The Lake St. Clair Chapter Auxiliary of Michigan report a very active and interesting year, beginning with a "Get Acquainted Coffee" in October, which was followed by a "Hobby Night" in November and a "Christmas Punch Bowl Party" with the husbands in December. This Auxiliary holds monthly meetings in homes of the members. Their next project will be a fund raising card party for some worthy cause.

After four fine and varied programs during the fall months, the Wives of Professional Engineers of the Washington County Chapter in Pennsylvania are now busily engaged in helping their husbands with plans for entertaining the State convention in May. They are handling the mailing of 5,000 post cards and 4,000 letters, as well as planning menus, collecting favors and arranging for decorations, hostesses and assisting with convention plans in many other ways.

The Auxiliary to the Bronx County Chapter in New York is planning a card party on May 15, and the proceeds will be used to set up a scholarship fund. The Auxiliary plans to give an award each year to an engineering student attending either Manhattan College or New York University, and will sponsor other projects during the year to raise money so that funds can be placed in their "Scholarship Award Fund." If possible, they would like to give two awards, one to each of the above schools, with the dean of each school selecting the student.

Pennsylvania SPE Plans Annual Meet, May 14-16

Two National Society officers will speak at the twenty-fourth annual convention of the Pennsylvania Society of Professional Engineers to be held at the George Washington Hotel in Washington, Pa., May 14-16.

Dr. Clark A. Dunn, NSPE president, is the scheduled speaker for the Past Presidents' Dinner on Friday evening, May 15, and Paul H. Robbins, NSPE executive director, will appear on a luncheon program on Saturday, May 16.

Registration will get underway at noon Thursday, May 14, in the hotel lobby. An Executive Board meeting is set for 2:30 to 5 p.m. A Dutch Treat Dinner from 6 to 8 o'clock will be followed by an informal reception to be sponsored by Washington County Chapter, host for the 1959 convention.

The visiting engineers will be welcomed to Washington by Mayor T. S. Fitch at the Friday luncheon when Guy R. Day, managing editor of *The Washington Reporter*, will speak. Gustav Stueber, convention chairman, will act as toastmaster. A tour of the Hazel-Atlas glass plant is planned for the afternoon.

Toastmaster for the Past Presidents' Dinner at which President Dunn will speak will be Roberts Bouson, president of the host Chapter.

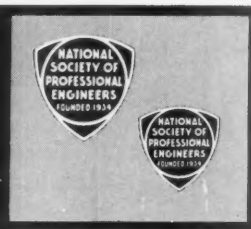
A full program has been planned for the ladies. One of the highlights will be the formation of a State Council of Auxiliaries, slated for a breakfast meeting on Friday morning.

The annual meeting of the State Society is slated for Saturday morning. The new Executive Board meeting will take place in the afternoon. Exhibits will be open daily in the Washington and College Rooms.

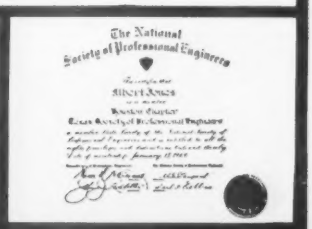
The Pennsylvania Society hopes to "burn" the mortgage on its recently-acquired State Office Building in Harrisburg during the three-day meeting.

Certificates and Emblems are available

The Professional Engineer emblem is available, styled as cuff links. Can also be ordered in large 3" size as a metal automobile emblem.



The beautiful Society shield is available in several styles. See coupon below.

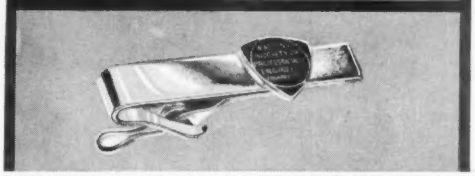


Order one of the handsome certificates showing your NSPE affiliation for your office wall.

Now available for the ladies is a beautiful Ladies Auxiliary Insignia.

The shield mounted as a tie chain makes a perfect gift.

The shield worn as a tie clasp is distinctive jewelry for any professional engineer member.



NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
2029 K Street, N. W., Washington 6, D. C.

I am enclosing my check in the amount of $ _____ for which please send me For Professional Engineers, P. E., and Junior Members, J. M.

J.M.	P.E.	
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	☐	Professional Engineer Emblem cuff links (set), priced at $3.00
	☐	Automobile Emblem (3"), priced at $1.00
☐		Ladies Auxiliary Insignia, mounted as a pin, priced at $5.00
☐		Ladies Auxiliary Insignia, mounted as a charm, priced at $5.00

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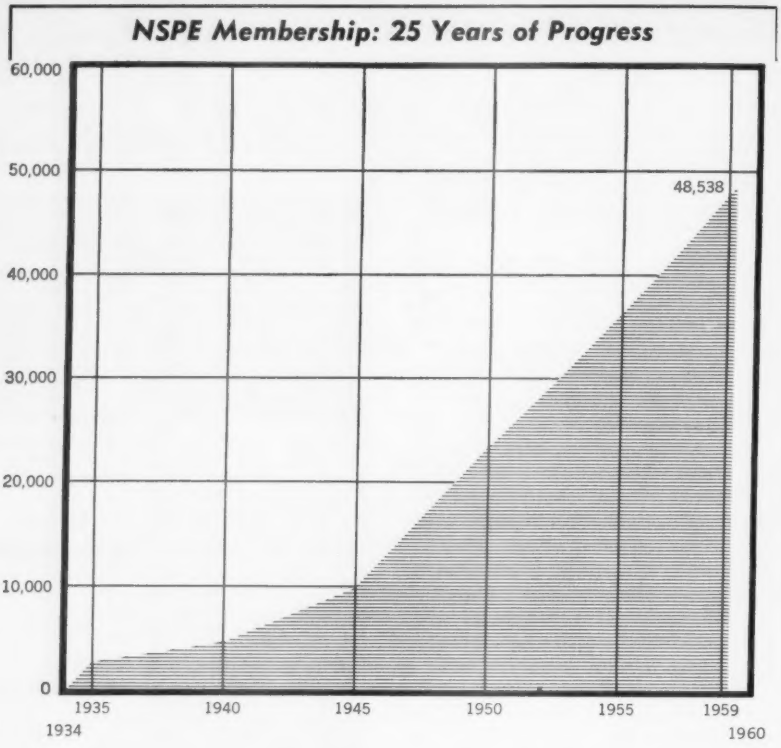
Management Perspective Series
Box 618
West Lafayette, Indiana

New Chapter Formed In Maryland Society

The Maryland SPE has announced the formation of a new chapter.

State and national officials attended a recent organizational meeting of the group. In attendance were B.E. Beven, MSPE president; V. J. Richter, MSPE vice president, and Col. Michael J. Blew, membership representative of the National Society.

Serving as chairman of the organization committee of the Cumberland Chapter is John I. Coleman. Albert S. Payne is vice chairman, and S.H. Harris, Jr., secretary-treasurer.



This Month's Authors . . .

Mr. Emerick

Robert H. Emerick has been engaged in consulting activities since 1946. His office is in Charleston, South Carolina. He was employed for fifteen years in public utility engineering, and has seen considerable duty with the Navy. Mr. Emerick was assistant planning officer for machinery at Pearl Harbor; repair and conversion officer, Charleston Naval Shipyard; industrial manager assistant, 6th Naval District, and chief, Industrial Division, Panama Canal Company.

He is the author of *Basic Refrigeration and Air Conditioning, Heating Design and Practice,* and *Power Plant Management.*

Mr. Emerick is a member of NPSE, ASME, and the Florida Engineering Society.

△ △ △

Mr. Alcabes

Joseph Alcabes is an industrial design engineer for Bechtel Associates in New York City. He received his Bachelor's degree in civil engineering from the City College of New York and his Master's of business administration in industrial management from the Bernard Baruch School of Business Administration in New York.

The article is a summary of the thesis recently completed for his MBA degree. Prior to 1956, Mr. Alcabes was employed as a field and office engineer in construction projects of both an industrial and commercial nature. He is a member of the New York Chapter of the New York State Society of Professional Engineers.

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Announcing...

's EXPANDED Readers' Service Department!

Now it is easier than ever for you to get information f-a-s-t on new products and services. The other side of this page when folded makes a *self-addressed reply envelope* that is all ready to come back to us. All you have to do to use it is to first read the advertisements, and the "Progress in Products" and "New Literature" features in every issue, noting that each makes specific reference to numbers on the form below.

Then if you want more information about any item, simply circle the corresponding number on the form, sign, fold, fasten and MAIL TODAY!

We do the rest. And within days, the data and literature you want is on its way to you.

Take advantage of this FREE service. Use this handy envelope NOW!

Please have information sent to me on items circled below: **May**

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Progress in Products

PORTABLE SPRAYER — Item 30

A portable spraying machine, designed to spray concrete curing membrane on freshly poured concrete, has been developed. Engineered for use in conjunction with a large sprayer, in areas where the large sprayer cannot operate, the new unit is suited for use on short runs of pavement, on highway cloverleafs, and for side edge spraying after forms are removed. It has a 15 gallon tank.

MENDING TAPE — Item 31

A transparent adhesive film with delayed setting action to facilitate accurate positioning is now available from Keuffel & Esser Co. Called Dulseal, the film is being produced as transparent film in sheets and rolls and as a mending tape. With its protective wax coating removed the film becomes tacky enough to allow approximate positioning. Several hours later it can still be relocated if needed. Left untouched for about twenty-four hours the film's adhesive "sets" and forms a permanent bond with the paper or cloth to which it was applied.

TECHAGRAPH PEN — Item 32

Alvin & Company, Inc., now offers a Techagraph technical fountain pen. The Techagraph is designed for high speed precision pen work. It may be filled directly from your ink bottle and provides a large, continuous supply of ink, thereby eliminating constant refilling. The Techagraph guarantees sharp, uniform lines every time and will not leak nor clog, it is claimed.

VENTILATORS — Item 33

A new line of direct and belt-driven centrifugal roof ventilators, designed especially for commercial and industrial ventilating systems, has been announced by Power Line Fan Co. The low-silhouette models have all-steel housings and framework, a ½" mesh bird screen, airfoil contoured wheel blades, and variable pitch pulleys on all belt-driven units. Included for accessories are: back draft dampers, mounting pedestals equipped with a removable access panel, heat shields for special high heat conditions, shaft seals, curb gaskets, etc.

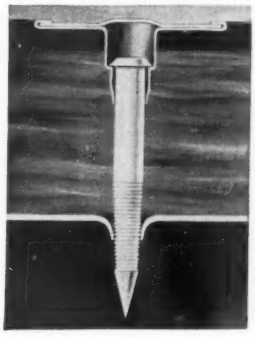
READER-PRINTER — Item 34

A machine that makes large size prints—up to 18 x 24 inches—of engineering drawings and other detailed documents from microfilm, completely automatically, has been announced. Called the "Thermo-Fax" Twenty-Nine microfilm reader-printer, the unit is both a reader and a printer in a single unit, producing prints in less than fifteen seconds by push button.

ROLL-UP WALLS — Item 35

An electrically powered roll-up wall has been developed for use in schools, auditoriums, restaurants, and other large area construction. The wall completely disappears near the ceiling, eliminating the need for side storage pockets and metal guide tracks or slots in the floor. Where vertical supporting posts or mullions are needed, the latter slide out of the way after the walls roll up. All visible parts are aluminum, but are also available in stainless or galvanized steel. Curtains of the roll-up walls are formed of interlocking aluminum slats. Manual operation by an auxiliary chain gear may be used in case of power failure.

FLEXHEAD NAIL — Item 36



A unique "Flexhead" nail for fastening Fiberglas roof insulation to wood and steel roof decks, has been announced by Owens-Corning Fiberglas Corporation. The nail, developed specifically for use with Fiberglas roof insulation, has a movable head, 1-3/16-inches in diameter, which rides down when pressure is applied, and snaps back up when pressure is released.

SCIENCE TABLE — Item 37

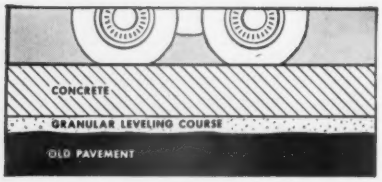
A portable science table that can be wheeled from room to room has been developed. Designed for elementary and junior high schools, it has a countertop of Johns-Manville Colorlith, cold-rolled steel construction, and heavy-duty hardware. Accessories include a hand-operated galley-type pump, stainless steel sink, two 1-gallon plastic carboys, 30 x 18" extension leaf, duplex 110V AC outlet, portable propane burner complete with propane cartridge, frame rest and hold-down bracket. The table is 48" long (66" with extension leaf), 30" wide and 36" high.

This column describes new products of general interest to professional engineers. For further information, circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

These listings are informational and are not an endorsement of the products, nor of the manufacturer's claims.

Runways at Chicago's O'Hare Field now converted to jet use

by an overlay of CONCRETE



With concrete, the strength is in the concrete itself. It is not just a smoothing overlay. Loads can be computed *mathematically*. With the bearing values of the soil plus the old pavement at O'Hare, 11 inches of concrete did the job—a big savings. Because the flexible pavement had become channelized and rutted, a 3-inch granular leveling course was used to insure uniform concrete thickness.

Resurfacing with concrete turns old runways into new. . . brings them up to jet-age needs

At Chicago-O'Hare International Airport, they simply covered the flexible pavement with modern concrete. With the old pavement serving as a subbase, 11 inches of concrete gives the necessary strength to handle the heaviest jet wheel loads expected.

The *beam* strength of concrete makes such overlays possible. Concrete is the only paving material that can be precisely designed to match *future* loads. That's why concrete runways can be expected to last 50 years and longer. There won't be any waviness or channelization, even under 150-ton jet airliner weights. And concrete withstands the heat of jet blasts, and the action of spilled fuel, as no other pavement can.

Concrete is the high-safety pavement — pilots themselves will tell you this. It is light-colored for maximum visibility. Its grainy surface means dependable skid resistance and better braking. Concrete creates no dragging action on take-offs.

These material and engineering advantages that make modern concrete ideal for airports make it unexcelled too, for highways of every class. Mile after mile of concrete across the country proves it can do the job better—and do it for less money in the long run!

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

(Circle 11 in Readers' Service Dept.)